ICPM Conference

ICPM 2019 ANTALYA

1st International Conference on Preventive Medicine (1st ICPM)

PROCEEDING BOOK

Editor: Mehmet Yaman

12-14 November 2019
Antalya-Turkey

Preface

The organizing committee of the **1st ICPM 2019** would like to welcome all participants to the 1st congress on "**1st International Conference on Preventive Medicine (1st ICPM)**", held in Antalya between 12-14 November 2019. The 1st ICPM 2019 is newly started and covers multidisciplinary fields: from "Nutrition, Hygiene and Food safety" to Environmental Factors, from Occupational health to Medical Support, from Lifestyle-Stress and mental health factors to Early Diagnosis and Bioindicators of Diseases.

The scientific congress program consists of 8 sessions that include **11 invited and 33 oral** presentations as well as **26 posters** to be presented in the respective sessions. In addition, researchers of Academia (**28 universities from 7 countries**) and Research Institutes will present up-to-date development on Preventive Medicine as well as applications to a wide range of various matrices.

We strongly believe that the discussions and the exchange of ideas among the participants during the 3 days of the meeting will make **1st ICPM** a brilliant platform to initiate new research collaborations, particularly in favor of the young scientists participating in the conference.

We wish you all to enjoy this conference and have a pleasant stay in Antalya, hoping to meet you again during the next **ICPMs**.

With our best regards
The Chair (on behalf of Organizing Committee)
Prof. Dr. Mehmet YAMAN
Firat University, Science Faculty, Department of Chemistry, Elazig-Turkey

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Ebru Calkan Yildirim (Ege U)
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Aysenur Celik (Firat U.)

GENERAL INFORMATION

Introduction

The **1st International Conference on Preventive Medicine (1st ICPM)** will be held on 12-14 November 2019 in Antalya-Turkey is a three-days scientific meeting covering all areas of Safe Nutrition, Health Risk Factors, Early Diagnosis and Bioindicators of Diseases as well as their interactions with Chemical and biochemical Analysis. The international congresses have provided an excellent framework for the presentation of new concepts, both investigations and on experimental animals related with preventive medicine. Researchers and scientists from Universities, Research Institutions, State Organizations, and the Drug Industries come together during the meeting to present and discuss the current state of the art in those areas. At the same time, it provides the grounds for the graduate and post-graduate students to present their projects, discuss scientific collaborations with other groups, as well as to explore employment opportunities.

I strongly believe that young researchers will have chance to improve their knowledge in deep of the preventive medicine by coming together with experienced scientists including invited speakers and scientific committee members.

Topics

To promote collaboration among scientists related with preventive medicine from different countries, "**1st ICPM 2019**" will provide adequate opportunities.
The topics include all areas of Preventive Medicine in applications such as, but not limited to, nutrition, biological and food matrices, environmental protection, biochemical studies, drug characterisation, method innovation and validation, instrumental development and applications, sensors and nanobiosensors.
The congress covers: the title of Nutrition, Hygiene and Food Safety (genetically modified and recombinant foods, Round up ready foods and feeds, Hormone and Antibiotic usage in veterinary, Usage of herbicide and pesticides, Food-additives, supplements, audits, fraud and adulteration, high fructose corn syrup (HFCS) and health risks-unhealthy nutrition, Toxic and endocrine disrupting chemicals in foods and food chain, Chemicals affecting intestinal microbiota, Influence of diet on mental health and behavior),
In the title of Environmental Factors (chemicals emitted from Industrial, thermal power and solid waste including plastics–incineration plants, and Radiation (particularly from common usage in the hospital and radiation applications in foods), Other risk factors from environmental (air, water and soil)-Indoor and outdoor pollution,
In the title of Early Diagnosis and Bioindicators of diseases (proteomics, metabolomics, metallomics, Potential New drugs and Analytical chemistry in preventive medicine)
In the other titles; Lifestyle-Stress and mental health factors (including despair and hope),
Drugs and vaccines, Public Health, Physical activity facilities, Actuators for Systemic diseases,
Traditional therapy and diseases, Medicinal plants -Bioactive molecules, Occupational health
Personalized preventive medicine, New methods in the determination of potential drug molecules and Medical Geology.

Location of Conference

1st ICPM 2019 will be held in Kemer-Antalya in north-coast of the Mediteranean Sea. Kemer-Antalya, a holiday district, is around 40 km away from the Antalya airport. Antalya is Turkey's World famous tourism city.
Some historical Places to visit in Antalya, Turkey: Phaselis Antique, Olympos Antique, Perge, Aspendos Antique Theater, Temple of Apollo, Side Ancient Theater, Goynuk Canyon and similars. Among them, PHASELIS ANCIENT CITY was founded by the people of Rhodes in the 7th. century BC. It has a rich history and is crucial for its ruins. Olympos, which was a member of the Lycian Union and a maritime trading city, just like its neighbour Phaselis.

Papers presentation

Scientific program will include Invited Speakers, which will provide an up-to-date presentation of modern trends in preventive medicine as well as of related subjects of chemical and biochemical analysis-interest. Oral Presentations will be presented in one hall. Contributed papers describing original research work will be also presented as posters in order to promote efficient discussion on new scientific ideas and results. The presenting authors should hang their posters before poster time, and remove them in the evening of the corresponding day. All posters are required to conform to portrait orientation. Posters should be clear and easy to read. Type size should be sufficiently large to allow people to read from 2-3 meters. The presentations can be in both English and Turkish. Poster and oral presentation will be accepted if at least one of the authors is registered and present at the conference for personal communication.

Best poster certificate

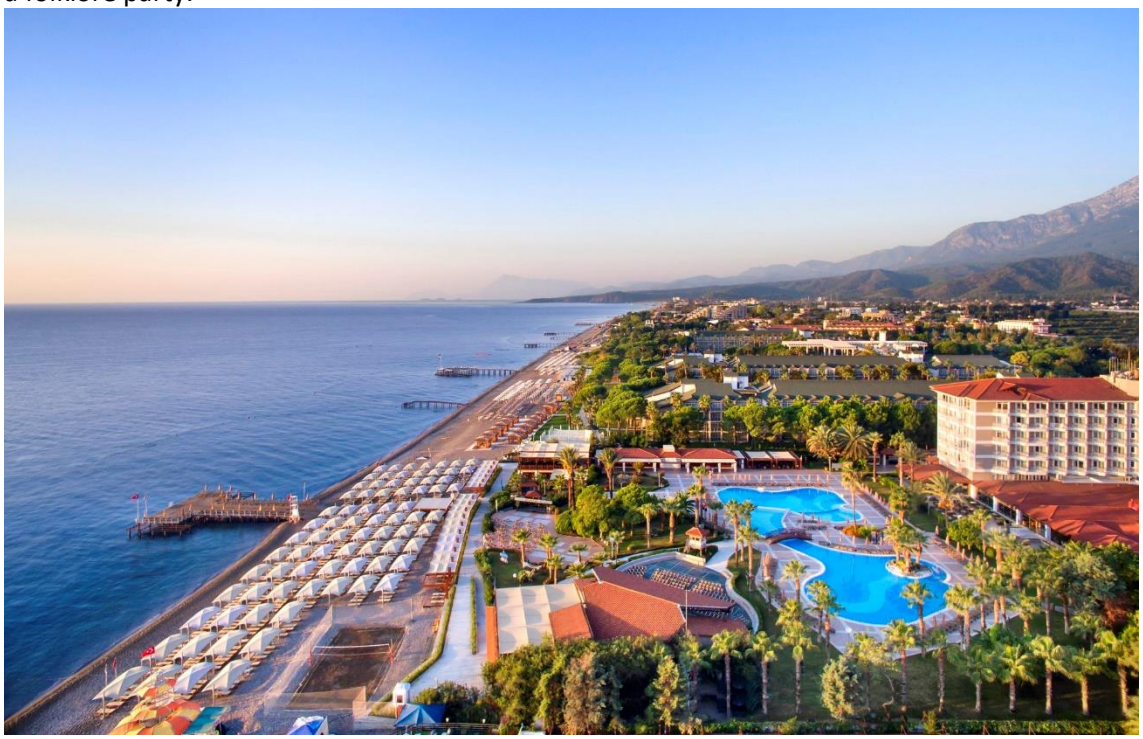
A competition for the best poster among the scientists in poster session will also take place. These certificates will be given to recognize excellence in research and presentation. The winners will be announced during the Gala Dinner on 13 November, 2019.

The winners are given below.

		Discount in next congress in total
The **1st award**: **Elif Tumay OZER**	-Uludag U	**%30**
- **2nd award**: **Tugba YAVUZ**	-Ege U	**%25**
-**3rd award**: **Esra ENGIN**	- Ege U	**%15**

Social events

Welcome reception-12 November, 2019: The Welcome Reception will be held on November 12, 2019. at the Akka Antedon hotel adjacent-sea. Event will close with local traditional dances and a folklore party.



Conference Gala dinner- 13 November, 2019: The Conference Gala Dinner will be held on November 13 at 20:00 in a restaurant of Akka Antedon Hotel. The menu will include a wide variety of traditional food, salads and drinks. Event will close with local traditional dances and a folklore party.

After welcome cocktail and Gala Dinner on nights of 12 and 13 November 2019, respectively, live modern and traditional music presentation will be done.

OPENING SPEECH

Dear Honorable Professors, Colleagues and Participants,

I am very happy to welcome all the participants coming to "**1st International Conference on Preventive Medicine**"

Respectable academics and friends;

Nowadays, the world is like a city and it is extrapolated from a single source to nutrition.

Particularly, the spread of genetically modified food to all countries, and

the unconscious use of recombinant products in backward countries,

require researchers to collaborate more and

multidisciplinary and up date studies is gaining importance.

In recent years, unpredictable health risks due to both the possibility of the ruling powers in the world to monopolize the world's nutrition and the spread of local traditional medical practices that are not the result of scientific methods, increase the need for preventive medicine.

As a result of the first mentioned risk, obesity, especially the problem of obesity among young people, has started to be effective in many countries and the relevant authorities support scientific meetings by hosting awareness-raising activities.

In particular, in the last years, the results of the researchers at different disciplines receiving the service from the institutions serving under the name of “central laboratory” which we have longed for years, has put at risk, because of the lack of analytical experience of the users and inability to validate results.

From this point of view, the first objective of this congress is to provide the opportunity for researchers interested in preventive medicine to come together and to exchange ideas in analytical-perspective meetings.

On the other hand, the purpose of congresses and similar scientific meetings is to make presentations of young researchers, to listen to presentations and to update themselves in an environment of well-known scientists.

However, in recent times, there has been a worldwide increase in misguided conferences in the name of international congresses that the same meetings are held several times a year, even in different countries every week, the audience listening to the presenter is small enough to be counted with fingers, in summary, presentations have not even the opportunity to evaluate by expert scientists, even the video is sent to the meeting without the participant’s. All these situations increase the need for a purposeful congress.

This conference was launched for all those purposes.

Hereby, I would like to thank the invited speakers, the members of Science Committee and especially for your participation, and I would like to express our honor to host the congress.

Statistical Information about the Congress

The scientific conference program consists of 9 sessions that include 11 invited and 33 oral presentations as well as 26 posters. The participants are of 27 universities from 7 countries. I believe that the discussions and the exchange of ideas among the participants during the 3 days will make this conference a brilliant platform to initiate new research collaborations.

I wish you all to enjoy this conference and have a pleasant stay in Kemer/Antalya.

- I wish the conference will be useful.
- My best regards**.**

Prof. Dr. Mehmet Yaman-
Chair

AÇILIŞ KONUŞMASI (in Turkish)

Değerli Profesörler, Meslektaşlar ve Katılımcılar,

"1. Uluslararası Önleyici Tıp Konferansı" na katılan tüm katılımcıları ağırlamaktan mutluluk duyuyorum.

Saygın akademisyenler ve arkadaşlar;

Günümüzde, dünya bir şehir gibidir ve tek bir kaynaktan beslenmeye doğru gideceği ekstrapole edilmektedir.

Özellikle, genetiği değiştirilmiş gıdaların tüm ülkelere yayılması, ve Rekombinant ürünlerin geri kalmış ülkelerde bilinçsizce kullanımı gibi nedenler, araştırmacıların daha fazla işbirliği yapmasını gerekli kılmakta ve multidisipliner ve güncel çalışmalar önem kazanmaktadır.

Son yıllarda, gerek Dünya'daki egemen güçlerin Dünya' nın beslenmesini elinde tutma olasılığı, gerekse bilimsel yöntemlerin sonucu olmayan yerel-geleneksel tıp uygulamalarının yaygınlaş-masına bağlı olarak öngörülemeyen sağlık riskleri, koruyucu tıpa olan ihtiyacı arttırmaktadır.

İlk zikredilen riskin sonucu olarak obezite, özellikle gençlerde obezite problemi çoğu ülkede etkisini göstermeye başlamış ve ilgili otoriteler, bu konuda farkındalık yaratacak bilimsel toplantılara ev sahipliği yaparak destek vermektedirler.

Koruyucu tıpa bilimsel yaklaşım, çok geniş bir alandaki kimyasal analizlerin değerlendirilmesiyle mümkündür. Dolayısıyla, kimyasal analizlerin doğruluğu oranında başarılı sonuçlar alınabilir. Özellikle, son yıllarda, yıllarca hasretini çektiğimiz "merkez lab" adı altında hizmet veren kuruluşların en yeni cihazları kullansalar bile kullanıcılarının gerekli analitik disipline sahip olmamaları ve sonuçlarının valide edilememesi nedeniyle, hizmeti alanların ilgili çalışmaları riske atılmaktadır. Bu bakış açısıyla, koruyucu tıp ile ilgili araştırmacıların, analitik bakış açılı toplantılarda, biraraya gelmelerine fırsat vermek ve fikir alışverişinde bulunmalarına zemin hazırlamak bu kongrenin 1. amacıdır.

Diğer taraftan, kongre ve benzeri bilimsel toplantıların amacı, alanında tanınmış uzman bilim insanlarının bulunduğu bir ortamda, genç araştırmacıların sunumlarını yapmaları, yapılan sunumları dinlemeleri ve kendilerini güncellemeleridir.

Ancak, yine son zamanlarda, tüm dünyada uluslararası kongre adı altında pıtırak gibi artan, aynı toplantıların yılda birkaç kez yapıldığı, hatta her hafta farklı ülkelerde yapıldığı, sunucuyu dinleyenlerın parmakla sayılacak kadar az olduğu, **özetle, sunumların uzman bilim insanlarınca değerlendirilmesi fırsatının olmadığı,** hatta katılımcının toplantıya gitmeyip videosunun gönderildiği dezenforme edilmiş toplantılar artmaktadır. Bütün bu durumlar, dezenforme olmamış kongreye olan gereksinimi arttırmaktadır.

Bu konferans bu amaçlarla başlatıldı. Bu nedenle, davet edilen konuşmacılara, Bilim Komitesi üyelerine ve özellikle katılımınız için teşekkür etmek istiyorum ve kongreye ev sahipliği yapmaktan onur duyduğumu belirtmek isterim.

Kongre ile İlgili İstatistiksel Bilgiler

Bilimsel konferans programı, 11 davetli ve 33 sözlü sunum ile 26 poster içeren 9 oturumdan oluşmaktadır. Katılımcılar 7 ülkeden 27 üniversiteden oluşmaktadır. 3 gün boyunca katılımcılar arasındaki tartışmaların ve fikir alışverişinin bu konferansı yeni araştırma işbirlikleri başlatmak için mükemmel bir platform haline getireceğine inanıyorum.

Hepinize bu konferansın tadını çıkarmanızı ve Antalya'da keyifli bir konaklama geçirmenizi diliyorum.

Konferansın faydalı olmasını diliyorum. Saygılarımla.

Prof. Dr. Mehmet Yaman-Kongre Başkanı

CONFERENCE PROGRAM

1st International Conference on Preventive Medicine (1st ICPM 2019)

12-14 November, 2019, Antalya-Akka-Antedon Hotel/Turkey

	12 November, 2019
13.30 – 16.00	**Registration- Akka-Antedon Hotel, Antalya-Turkey** The registration desk will be open everyday during conference hours
16.00 – 17.00	➢ **Welcome Ceremony** ➢ Respect-Silence of Independence and Opening Speeches: **Prof. Dr. Mehmet Yaman (Chair)** **Prof. Dr. Seref Gucer** (on behalf of continuation committee) *Honorable* ***Inv. 1: Prof. Dr.* Fikrettin SAHIN** **Potential Preventive Role of Boron Against Obesity and Related Diseases**
17.00-17.20	Tea/Coffee break
	Session 1- Chairs: Prof. Dr. Sezgin BAKIRDERE - Prof. Dr. Durisehvar OZER UNAL
17.20-19.10	***Inv. 2: Prof. Dr.* Slawomira SKRZYPEK** **Carbon–Based Sensors in Voltammetric Determination Of Drugs**
	OP1 **Eric Mensah-** To Promote the attainment of healthy and sustainable Mental habits in children
	OP2-Esra Tokay- Thymoquinone, a main component of Nigella Sativa, decrease of URG-4/URGCP gene expression in Pancreatic cancer cells.
	OP3-Dilsat ArikSoysal- Detection of Cystic Fibrosis Gene Mutation by using Biosensor-based Electrochemical Diagnostic Kit
	OP4-Dilek Pirim- MicroRNA-associated candidate molecular pathways and key regulators in schizophrenia identified by using bioinformatic analyses
	OP5- Mustafa Çelebier- How to Use Metabolomics on Preventive Medicine
	OP6-Fazilet Erman-Quantitative ICP-OES Determination of Trace and Essential Elements in the Plant Specy of *Ferula orient.*
19.30-22.00	**Welcome Coctail-Dinner-Music**
	13 November, 2019
	Session 2 - Chairs: Prof. Dr. Fikrettin SAHIN - Prof. Dr. F. Nil Ertas
08.30-10:10	**Inv 3: Dr. Serdar SAVAS** **7 K Medicine: Future Health Services Model**
	Inv 4: Prof. Dr. Cengiz CAVUSOGLU **The role of microbiota in health and diseases and the factors affecting it**
	OP7- Nevin Erk- Development and Application of Advanced Absorbance Subtraction Spectrophotometric Method for the Quantification of the Antiretroviral Compounds in Medical Dosage Forms
	OP8- Semra Turkoglu- Protective effects of endemic plants against cancer and bacteria
10.10-10:25	Tea/Coffee break
	Session 3 -: Chairs: Prof. Dr. Ibrahim ISILDAK- Prof. Dr. Elif Tumay OZER
10.25-12.00	**Inv 5: Prof. Dr. Fatma Akar** **Fructose (HFCS) as a cause of diabetes and obesity**
	OP9-Esra Sumlu- Effects of Lactobacillus plantarum on hepatic insulin signaling and glucose transporters in high-fructose-fed rats
	OP10- Aykut Bostancı- Time and dose dependent cytotoxic effects of fructose on rat hepatocytes
	OP11-Semiramis Karlidag- Effects of Feeding Honeybee (Apis Mellifera L.) Colonies with Different Industrial Carbohydrate Sources on Royal Jelly and Honey's Sugar Composition
	OP12- Nur Banu Bal- Gender dependent effects of resveratrol and regular exercise on the expression of various proteins in kidney
	OP13-Güler Çelik-Determination of the polycyclic aromatic hydrocarbons formed during deep fat frying process
	O14-Mehmet Öztürk - Is propolis a nostrum?
	OP15-Ibrahim Dolak-Selective Seperation of Hemoglobin in Blood Serum Using Molecularly Imprinted Polymer-Based Affinity Traps
12.00-13.30	Lunch

	Session 4 - Chairs: Asst. **Prof. Dr. Altan ERCAN**-Prof. **Dr. Slawomira SKRZYPEK**
13.30-15.00	**Inv 6: Prof. Dr. Fernando BENAVENTE** **Immuno-and aptamer-affinity sorbents for on-line preconcentration in capillary electrophoresis-mass spectrometry. Towards a selective, sensitive and reliable analysis of biomarkers for diagnostics**
	OP16-**Altan Ercan**-Evaluation of Immunoglobulin G glycosylation in Rheumatoid Arthritis as a biomarker for prognosis, diagnosis and response to treatment
	OP17-Pınar Kara- Aptamer-Based Electrochemical Nanobiosensor Applications for Early-Stage Cancer Diagnosis
	OP18- Ozlem Sogut- Complementary therapy with essential oils: Aromotherapy
	OP19- Cansu Aras- In Vitro Controlled Release and Cytotoxicity Test of Nigella Sativa Oil Loaded Polyurethane Nanofiber Mat: As Using Potential Wound Dressing
	OP20- Aysenur Celik- A New Approach to Researchers of Potential Drug Molecules: Gene Therapy
15.00-15.20	Tea/Coffee break
	Session 5- Chairs: **Dr. Fernando BENAVENTE – Prof. Dr. Nevin ERK**
15.20-16.35	***Inv 7: Prof. Dr.* Nina Chanishvili** **Bacteriophages-natural agents to fight drug-resistant bacteria**
	OP21-Ozan Gurbuz- The Effects of a Food Industry by-products Coffee Silverskin on Kefir Microbiota
	OP22- Mariia Nesterkina- Carvone hydrazones as potential analgesic and anticonvulsant agents
	OP23- Gulsah Ozcan Sinir-The Application of Vibrational Spectroscopy on Food Authentication
	OP24-Zyad Nawzad- Impacts of Rare Earth Elements on Animal and Human Health
16.35-16.45	Tea/Coffee break
16.45-17.30	**Session 6: Poster Session-** Chairs: **Prof. Dr. Ozlem SOGUT- Prof. Dr. Iryna Kravchenko** **Prof. Dr. Ayse GUL MUTLU- Prof. Dr. Ulku Dilek UYSAL-** Asst. **Prof. Dr. Altan ERCAN**
	Session 7- Chairs: **Prof. Dr. S. Beniz GUNDUZ - Prof. Dr. Pinar KARA**
17.30-19:00	**Inv 8: Prof. Dr. Erdem YESILADA** **Overview to Phytotherapy and Food supplements in the Preventive Medicine**
	O25- Tugba Boyuneğmez Tumer- **Novel Phytohormones Strigolactones: Their potential therapeutic activities on different chronic inflammation related disease conditions**
	OP26- Sumru Sozer Karadagli- Hirudotherapy (Medical Leech Therapy) and Adverse Effects
	OP27-Mustafa Ceylan- Unusual function of wetlands as hirudotherapy centers: An ignored threat in terms of preventive medicine
	OP28-Murat Celiker-Silica Dust and Health: A Case Study on Modeling of Dust Emissions from Mining Operations
19.30-22.00	**Gala Dinner-Music**
	14 November, 2019
	Session 8- Chairs: **Prof. Dr. Nina Chanishvili- Prof. Dr. Nevzat Artık**
08.30-10.05	***Inv 9:* Dr. Hasan TURKEZ** **The impact of national genome projects on applications in preventive medicine.**
	Inv 10: Prof. Dr. F. Nil Ertas **Overview to pesticides in the Preventive Medicine**
	OP29-Ulkü Dilek Uysal-Spectrophotometric Determination of Al with Ortho Hydroxy Schiff Base in Drug
	OP30-Feyzullah Tokay-A Novel Vortex Assisted Dispersive Solid Phase Extraction of Some Trace Elements in Essential Oils
	OP31-Murat Celiker- Temporal changes in gross α and β activity concentrations in a well located in the Uluova aquifer (Elazığ, Turkey): A health risk assessment
10.05-10.20	Tea/Coffee break
	Session 9: Chairs: **Prof. Dr. Fatma Akar- Assoc. Prof. Dr. Levent PELIT**
10.20-11.40	***Inv 11: Prof. Dr.* Sezgin BAKIRDERE** **Toxic and endocrine disrupter chemicals in foods and food chain**
	***Prof. Dr. Nevzat Artık*-on behalf of Organizing committee-Food safety in Turkey and EU countries**
	O32- Yusuf Sicak- The cytotoxic activity of Polysaccharides of Tricholoma caligatum (Viv.) Ricken: An edible Anatolian mushroom under the class matsutake
	OP33- Figen Erek- Determination of Trace Metals in Henna Sold in Diyarbakir, Turkey Local Markets
11:40-12:00	Closing
12:00-13:30	Lunch
13.30-20.00	Social program **(Optional)**

INVITED SPEAKERS (IS)

IS1- Potential Preventive Role of Boron Against Obesity and Related Diseases

Fikrettin Sahin, Hüseyin Abtik, Ayşegül Doğan, Selami Demirci

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Obesity and associated diseases, such as type 2 diabetes, hypertension, cardiovascular disease, cancer, and metabolic syndrome or posttraumatic stress disorder (PTSD), are worldwide medical problems, leading to increased healthcare costs, morbidity, and mortality. An estimated 2.1 billion people worldwide are thought to be overweight or obese, and 2.8 million deaths are associated with obesity annually. Although the exact molecular mechanisms of obesity are not well understood, uncontrolled hyperplasia and hypertrophy of adipocytes, the main units in fat tissue, are known to contribute to the development of obesity. The main approaches to treating obesity focus on targeting Wnt/β-catenin and AKT signaling pathways to limit lipid storage and adipocyte cell propagation. Although some therapeutic options have been presented to the market for the treatment of obesity, their clinical use is limited due to having severe side effects including hypertension, cardiovascular problems, liver diseases and psychiatric disorders. Therefore, development of a new, safe and efficient anti-obesity preventive drug is very important. Boron treatment has been reported to be associated with weight reduction in experimental animals; however, its effects on pre-adipocyte differentiation and anti-adipogenic molecularmechanisms are unknown. Our present studies demonstrated the inhibitory activities of boric acid (BA) and sodium pentaborate pentahydrate (NaB) on adipogenesis using common cellular and animal models in vitro and in vivo conditions. Boron treatment repressed the expression of adipogenesis-related genes and proteins, including CCAAT-enhancer-binding protein α and peroxisome proliferator-activated receptor γ, by regulating critical growth factors and the β-catenin, AKT, and extracellular signal-regulated kinase signaling pathways in vitro tests. In addition, although boron treatment did not induce apoptosis in pre-adipocytes, it depressed mitotic clonal expansion by regulation of cell cycle genes. In vivo studies confirmed our in vitro test results. Overall, these data offer promising insights into the prevention/treatment of obesity and associated diseases.

Keywords: Boron, obesity, adipogenesis, cancer, Wnt/β-catenin, treatment

IS2- CARBON–BASED SENSORS İN VOLTAMMETRİC DETERMİNATİON OF DRUGS

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Introduction: Rapidly increasing progress in the field of the pharmaceutical and biomedical sciences brought in a revolution on human health. New drugs are synthesized and their determination is of high importance. The sensitive determinations in clinical samples at low concentrations along with high selectivity is required to perform successful drug analysis. Until recently, principally spectrophotometric, and chromatographic techniques were applied to pharmaceutical analysis. Nowadays, the modern electrochemical methods are rapidly gaining popularity in the determination of these agents and their metabolites, and at the same time, they are inexpensive and highly sensitive. With the recent significant progress in the electrochemical techniques, the advancements with regard to instrumentation involving the development and application of the range of solid carbon–based electrodes to the detection of pharmaceutical preparations and biological fluids is observed. In this work, the different solid carbon-based working electrode materials were applied in the analysis of drugs (imatinib, teriflunimide, oxolinic acid, and bithionol).
Materials and Methods: Voltammetric measurements were performed using an EmStat USB potentiostat (Palm Instruments BV, The Netherlands) or μAutolab type II potentiostat-galvanostat (EcoChemie, Autolab B.V., The Netherlands). A three–electrode system was used with platinum wire as counter electrode, silver chloride electrode as reference electrode, and a boron–doped diamond electrode (BDDE, Windsor Scientific Ltd., United Kingdom), a bare egde plane pyrolytic graphite electrode (EPPGE, ALS Company Ltd, Japan) or EPPGE modified with graphene nanoplatelets (GNPs) as the working electrodes.
Results: The effect of pH on the electrochemical behavior of drugs was studied using DPV or SWV in Britton-Robinson buffer solutions (pH range of 2.0–12.0). The impact of the influence of the DPV or SWV parameters was also tested. Further, the linear calibration curves were constructed, and a biological relevance of the developed DPV or SWV procedures was demonstrated by quantitative analysis of drugs in the spiked human urine samples with satisfactory recoveries. The influence of some interfering compounds and ions was also evaluated, and good selectivities of the proposed procedures was obtained.
Conclusions: The electrochemical sensors were applied for the sensitive and selective determinations of imatinib, teriflunimide, oxolinic acid, and bithionol. The sensors provided the excellent results for DPV or SWV determinations of drugs.

IS3- 7K Medicine: A Model for Future Health Services

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Chronic-complex diseases comprise more than 90% of the burden of disease in Turkey and in other OECD countries. The main problems in the prevention of these diseases are:

- Who will be prevented?
- Which disease will be prevented?
- How it will be prevented?

The 7K Medicine model developed by Dr. Serdar Savaş, is a possible solution to this problem.

7K Medicine can be summarized as follows. Medicine should take a personalized (*Kişiye Özel in Turkish*) approach considering the genomic and the other 'omics' characteristics with phenotypic and lifestyle information. The predictive (*Kestirimci in Turkish*) feature of personalized medicine calculates personal risks foreseeing the development of each chronic-complex disease for the very individual. This gives the opportunity to create personalized protective (*Koruyucu in Turkish*) interventions. When providing these interventions, a '' holistic and comprehensive (*Kapsamlı in Turkish*) approach is applied based on the systems biology perspective. This process supported by technology creates precise (*Keskin in Turkish*) assessments and interventions. Evidence-based (*Kanıta dayalı in Turkish*) indicates that the personal assessments and interventions are in accordance with the findings obtained for that individual. Finally, the individual must take control of his/her life under the supervision of health professionals, thus the individual must become participatory (*Katılımcı in Turkish*) in his/her process, from passive to active.

Gentest' is a practical application model of 7K Medicine developed by the Institute of Public Health and Genomics established by Dr. Serdar Savaş in 2004 at Hacettepe University Sciencepark.

Key words: 7K Medicine; chronic-complex diseases; Gentest; personalized medicine

(In Turkish)-7K Tıbbı: Geleceğin Sağlık Hizmetleri Modeli

Kronik-kompleks hastalıklar toplumumuzda ve diğer OECD ülkelerinde hastalık yükünün %90'ından fazlasını oluşturmaktadır. Bu hastalıkların önlenmesinde temel sorunsal kimde, hangi hastalığın, nasıl önleneceğinin belirlenmesidir. Dr. Serdar Savaş tarafından geliştirilmiş olan 7K Tıbbı modeli bu soruna bir çözüm önermektedir.

7K Tıbbı şu şekilde özetlenebilir: Tıp, bireyin genomik ve diğer 'omics' özellikleri ile diğer fenotipik ve yaşam tarzı bilgilerini dikkate alarak 'kişiye özel' bir yaklaşım sergilemelidir. Kişiye özel tıbbın her bireyin gelecekte karşılaşabileceği hastalıkları ön görmesi ve kişiye özel riskleri hesaplaması 'kestirimci' özelliğidir. Bir insanın gelecekte hangi hastalıklarla karşılaşma riskinin olduğu ortaya konduğunda o kişiye özel 'koruyucu' müdahaleler geliştirilmelidir. Tıbbi yaklaşımların sistem biyolojisi bakış açısıyla insanı her boyutuyla, bütünsel ve 'kapsamlı' olarak ele alması gerekir. Bu süreçte teknolojik gelişmeler kişiye özel bilgilerle de desteklendiğinde tespitlerin ve müdahalelerin nokta atışı, 'keskin' olmasına imkan tanımaktadır. Birey özelinde yapılacak değerlendirmelerin ve müdahalelerin, o bireyde elde edilen bulgular doğrultusunda yapılması gerektiğine 'kanıta dayalı' işaret etmektedir. Son olarak ise; birey sağlık profesyonellerinin danışmanlığında kendi yaşamının kontrolünü ele almalıdır, böylece edilgen konumdan etken konuma geçerek kendi sürecinin 'katılımcı'sı olmalıdır.

Dr. Serdar Savaş tarafından, 2004 yılında, Hacettepe Üniversitesi Teknokent'te kurulmuş olan Toplum Sağlığı ve Genom Bilim Enstitüsü tarafından geliştirilmiş olan 'Gentest' bugün 7K Tıbbı'nın pratik bir uygulaması olarak hayata geçirilmiştir.

Anahtar Kelimeler: 7K Tıbbı; kronik-kompleks hastalıklar; Gentest; kişiye özel tıp

IS4- The role of microbiota in health and diseases and the factors affecting it

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Konak ve birlikte ortak ekosistemi paylaştığı mikrobiyomu holobiont ya da süperorganism olarak tanımlanmaktadır. İnsan vücudunda yaklaşık kendi hücresi (3 X1013) kadar bakteri (3.9 X1013) hücresi bulunmakta, insan genomuna ait genetik materyalin 100 katından daha fazla bakteriyel genom yer almaktadır. Bu genler, bağışıklık sisteminin başa çıkması gereken en büyük potansiyel antijen kaynağını kodlamaktadırlar. Taksonomik açıdan bakıldığında insan mikrobiyomu tün canlılar aleminden türleri içermektedir. Bakteri ve Archaea'lardan oluşan prokaryatlardan en az 30 filum ve 950 cinsin insan mikrobiyomu ile ilişkili olduğu, mantarlar, protozoalar ve algleri içeren mikrobiyal ökaryotların insan mikrobiyomunda yer alabildiği bilinmektedir. Ayrıca son yıllarda bakteri virüsleri bakteriyofajlar başta olmak üzere insan, protozoa, mantar virüslerinin de mikrobiyomun bir parçası olarak önemleri daha iyi anlaşılmaya başlanmıştır. Bağırsak mikrobiyotası insan için yararlı bazı vitaminleri üretmekte, yaşam için gerekli bazı gıdaların alınabilmesi için besinleri parçalamaktadır. Bunun yanı sıra doğal immün sistemin ve T hücre alt gruplarının optimal olgunlaşmasına yardımcı olarak ve anti-iflamatuvar bileşikler üreterek mukozal ve sistmik immünolojik homostaza katkı sağlamaktadır. Bağırsak mikrobiyotasını etkileyen çeşitli faktörler bulunmaktadır. Doğumun şekli, anne sütüyle beslenme ve antibiyotik kullanımı yenidoğanda bağırsak mikrobiyotasını etkileyen önemli faktörlerdir. Yaşla birlikte bağırsak mikrobiyotasının değiştiği bilinmektedir. Ayrıca beslenme şekli, prebiyotik ve probiyotik kullanımı, hijyen, konağın genotipi ve hastalıkları da bağırsak mikrobiyotasini etkileyen faktörler arasındadır. Sağlıklı mikrobiyota dengesinin bozulması disbiyozis olarak tanımlanmaktadır. Mikrobiyotanın hastalık gelişimine etkisinin temel olarak immün sistem üzerinden olduğu düşünülmektedir. Mikrobiyota ve doğal immün sistem arasındaki üç eş zamanlı etkileşim mikrobiyota aracılı hastalık fenotiplerinin ortaya çıkmasında önemlidir. İlk olarak, mikrobiyal ürünler, düzelmeyen inflamasyonun oluşumuna katkıda bulunan kronik immün yanıtların kalıcı uyarıcıları olarak hizmet edebilmektedirler. Örneğin, mikrobiyal sinyaller, mukozada enfeksiyonun yol açtığı hasarlanma sonrası inflamasyon ve doku hasarını devam ettirebilmektedir. İkincisi, doğal immün sistemin olgunlaşması sırasındaki anormal mikrobiyal gelişme, immünolojik toleransın indüklenememesine yol açabilmekte, bu da daha sonra alerjene bağlı solunum yolu hiperreaktivitesi gibi otoimmün ve otoinflamatuar bozukluklara neden olabilmektedir. Üçüncüsü, mikrobiyota, uzak bölgelerde aktif olabilen mekanizmalar aracılığıyla dokuya özgü bağışıklığı kontrol eden faktörleri etkilemekte ve bu nedenle, disbiyoz uzak organlardaki patofizyolojileri tetikleyebilmektedir. Mikrobiyotanın karaciğer yağlanması, ateroskleroz ve obezite gibi metabolik hastalıklar, diyebet, inflamatuar bağırsak hastalığı, atopi, alerjik astım, romatoit artrit gibi otoimmün veya otoinflamatuar hastalıklar ve kanser oluşumu üzerinde bir faktör olarak rol oynayabileceği ileri sürülmektedir. Henüz yolun çok başında olmamıza karşın bir bozukluğun diyet müdahaleleri yoluyla modülasyonu ve bunların mikrobiyom-immün etkileşimleri üzerindeki etkileri heyecan verici bir araştırma alanıdır.

Keywords: Microbiota, gut microbiome, health, disease, innate immunity

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IS5- Fructose (HFCS) as a cause of diabetes and obesity

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High-fructose corn syrup (HFCS), one of the major sources of fructose, is still used as a sweetener in processed foods and soft drinks despite ongoing negative debate. The excess consumption of fructose in daily human nutrition may contribute to the worldwide epidemic of type 2 diabetes and obesity. High intake of dietary fructose has been shown to cause hyperglycemia, hyperinsulinemia, hypertriglyceridemia and abdominal adiposity in human and animals. Fructose-induced metabolic disorders are more likely related to abdominal fat accumulation, but independent from the general obesity. We and others showed that dietary high-fructose intake leads to insulin resistance through downregulation of insulin signaling in insulin sensitive organs such as vascular system, liver, fat tissue, kidney and skeletal muscle in rodents. This dietary intervention may also produce an increase in the expression of endogenous inflammatory factors as well as an alteration in antioxidant/oxidant genes and proteins. In this context, we demonstrated that dietary high-fructose causes endothelial, hepatic, renal and testicular degeneration together with activation of inflammatory pathway and provocation of oxidative stress. Moreover, fructose-induced hepatic steatosis was associated with upregulation of lipogenic genes and glucose transporters. Inflammatory mediators and oxidative damage may possibly constitute a link between metabolic irregularity and insulin resistance [1-5]. Here, we provide new insights into understanding the underlying mechanism responsible for fructose-induced metabolic disorders.

Keywords: *Diabete*, *Obesity*, *HFCS*, *fructose*.

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IS6- An Overview to Current Approach in Phytotherapy Based on the Scientific Evidences

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Phytotherapy is simply defined as "use of the rich chemical contents of plants to support health and to heal the symptoms or treatment of diseases". Plants have been the basis for medical treatments through much of human history, and such traditional medicine is still widely practiced today. Although use of plants as medicine dates back to prehistorical ages, the term "Phytotherapy" was first nominated in 1913 by a French Physician Leclerc. That time Phytotherapy was only limited to herbal medicines which had been used in the European healing practices. However, the current popularized Phytotherapy covers mostly worldwide herbal medicines including dietary supplements.
Plants have also been considered as a source for discovery of new medicines in modern medicine. Many plant-derived substances underlie the basis for evidence-based pharmaceutical drugs after isolation from its source. However, recent scientific evidences have clearly proven that preserving various substances from a given source, i.e. use of whole plant or its extract, with less processing is safer or more effective. On the other hand, "standardization" is the most important and indispensable fact of current Phytotherapy approach. This is particularly important to provide reproducible healing responses.
This study discuss the further points standing out in the current Phytotherapy approach based on the scientific investigations.

IS7- BACTERIOPHAGES-NATURAL AGENTS TO FIGHT DRUG-RESISTANT BACTERIA

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Bacteriophages (shortly – phages) are viruses acting solely against bacteria. Soon after their discovery by French microbiologist Felix d'Herelle they have been used for therapy and prophylaxis of bacterial infections. This direction became very popular all over the world, however after discovery of penicillin the interest towards phage therapy (i.e. use of bacteriophages for medicinal purposes) was dramatically decreased in the western countries. On the contrary the former Soviet republics not only maintained this research direction, but largely contributed to its development. The interest towards phage therapy was renewed after development and terrifying spread of multiply drug-resistant (MDR) bacteria.
The presentation will focus on advantages of phage therapy and prophylaxis in comparison with antibiotics, the experiences in different fields of medicine, results of clinical trials, difficulties of introduction of this approach into medicinal practice in western countries, etc. will be discussed as well.

IS8- Immuno-and aptamer-affinity sorbents for on-line preconcentration in capillary electrophoresis-mass spectrometry. Towards a selective, sensitive and reliable analysis of biomarkers for diagnostics

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Enzyme-Linked ImmunoSorbent Assay (ELISA), and other biosensors based on immuno-affinity, or more recently aptamer-affinity, have been widely developed and applied in the analysis of biomarkers for research and diagnostics. However, despite the excellent selectivity provided by the affinity ligand, these methods can be prone to false positive because of non-specific adsorption, cross-reactivity and lack of a reliable target analyte identification.

In this presentation, as an alternative to these methods, I will present the use of immuno- and aptamer-affinity sorbents for on-line solid-phase extraction capillary electrophoresis-mass spectrometry (SPE-CE-MS). Immuno- and aptamer-affinity SPE-CE-MS is simple and powerful three-dimensional tool that combines the high extraction selectivity of antibodies and aptamers, with the high-performance separation features of the microseparation technique CE and the uniqueness of MS detection, which allows a reliable identification of the preconcentrated and separated molecular biomarkers. I will show the potential of SPE-CE-MS with these sorbents describing our last investigations for the analysis of biomarkers in biological fluids.

Keywords: *antibody, aptamer, biomarker, capillary electrophoresis, mass spectrometry, on-line preconcentration.*

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IS9- Overview to pesticides in the Preventive Medicine

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The term pesticide covers a wide range of compounds including insecticides, fungicides, herbicides, etc. used greatly to pest control and agricultural output. Ideally, these compounds are expected to be lethal only to the targeted pests however; they constitute one of the major concerns since their residue levels in food stuff may risk the health of consumers and farm workers as well as the unwanted side effects to the environment. Due to their potentially serious health effects, the world-wide deaths and chronic diseases are increasing every year. Residual amounts of pesticides and their metabolites have been found in drinking water and foods, increasing concern for the possible threats to human health posed by exposure to these chemicals. Contamination of surface waters constitutes a major issue at regional, national, and global levels. Chemicals originating from agricultural activity enter the aquatic environment through atmospheric deposition, surface run-off or leaching and frequently accumulate in soft-bottom sediments and aquatic organisms.

An analytical approach is essential for revealing the adverse health effects of pesticides and to minimize human exposure to pesticides. This presentation covers the modern and reliable analytical techniques for trace determination of the pesticides in food, environmental and clinical samples. Pesticide residue analysis in developed countries started in the 1950s and the fact that agricultural products have an important place in the export of the countries has led to the confirmation of the fact that these products are free of residues. Therefore, in the late 90s, quality control and quality assurance parameters, which are an indicator of the reliability of analyzes, came into question in pesticide residue analyzes. The concept of accreditation has emerged from the application of the parameters namely; sample matrix effect, method validation, and measurement uncertainty assessments. In our country, pesticide residue analysis is carried out as a routine analysis especially in public and private laboratories which are accredited by Turkish Accreditation Agency. In addition to routine analyzes, residual analysis of these products is carried out by establishing controlled trials with projects carried out by the research institutes within the Ministry of Food and Agriculture.

The most widely used detection technique for the determination of pesticides in agricultural product is mass spectrometry combined with gas and/or liquid chromatography. In general, multi-residue methods with selective sample treatment methodologies have been developed for this purpose. The limitations of multi-residue methods, the future perspectives and the trends for pesticide residue analysis in foods are reviewed.

Keywords: *pesticide toxicity, residue analysis, chromatography*

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IS10- Toxic And Endocrine Disrupter Chemicals In Foods And Food Chain

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Human beings have been surrounded by variety of dangerous chemicals for many years. Endocrine disrupter chemicals are known to be their abilities to mimic or interfere with the function of endocrinal hormones even at trace levels. In literature their presence in air, soil and water sources has been reported [1]. It is proved that continuous intake of these chemicals results in bioaccumulation in some parts of living organisms [2]. On the other side, rapid industrialization and urbanization have caused the enhancement in heavy metal usage which can also change some biological functions in human bodies at very low concentrations [3]. For these reasons, trace level determination of all these chemicals is an important topic in analytical chemistry. Different analytical methods have been developed to detect toxic chemicals in complex matrices. However, detections of analytes at trace levels with high accuracy and precision need expensive and sophisticated instruments. Alternatively, new and simple strategies to reach low detection limits have been introduced in literature. Slotted quartz tube applications on conventional flame atomic absorption spectrometer is an example to increase sensitivity of the instrument for the determination of elements. Preconcentration methods are also useful to separate and enrich the analyte(s) for trace determinations. In addition, accuracy and precision have been improved by isotope dilution strategies for both organic and inorganic analytes. These methods are also combined with preconcentration methods for trace analyte determinations [4].

Keywords: *Endocrine disrupter chemicals, heavy metals, analytical strategies, food samples.*

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IS11- THE IMPACTS OF NATIONAL GENOME PROJECTS ON APPLICATIONS IN PREVENTIVE MEDICINE

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Abstract-Over the last 10 years, a number of countries have started to use genome technology in their national genome researches and characterized the genetic basis of inhabitants living in the corresponding country. The information from different national genome projects such as Genomics England, SweGen, Sequencing Initiative Suomi improves our knowledge about the molecular genetic background of different inherited disorders. The update of new genes predisposing to these complex pathologies have multiplied exponentially over the years. There is no doubt that genomics based national projects will profoundly transform our perception of health since the sequencing of the human genome literally gave us access to the "dictionary of life". Genomics provides new insights into the intrinsic functioning of our bodies and that will lead to improve a much more predictive, preventive and personalized medicine. Identification of characteristic features of diseases may be helpful to understand the genetic differences between the individuals in the country. Genomic information could be used as a effective data for the development of prevention care and treatment, especially in high risk subjects with an extremely rare condition. Therefore, national genome projects have important roles in identifying the related population groups living a country and assisting in the design of targeted preventive strategies. This speech will reflect the tangible outputs of these substantial research projects as ultimate promise of revolutionizing the diagnosis, treatment and prevention of many disorders.
Keywords: *Genome project, preventive medicine, disease, genomic medicine, medical innovation*

INTRODUCTION

A great progress has been made in the human genome and extend our understanding of the role of genome in health and disease in recent. While our knowledge about the genetic details of biology was scarce, we have provided immense amount of structural information about individual genes in the last decade. In the late 1990s, the human genome project enabled to an improvement in the positioning and identification of morbid genes through the availability of genetic information and data. Having arrived at the candidate region, the researchers now had a list of genes already mapped in this interval and could begin by testing their possible involvement before searching for yet unknown genes (Boguski et al. 1993; Dib et al. 1996; Sulimova et al. 2000).
Understanding genomic data requires the development of bioinformatic technologies in line with sequence-based approaches. Improvement in these sciences provide a continuous potential for diagnosis of disorder and the improvement of more effective treatment perspectives. They also provide opportunities for potentially more focused clinical screening and changes in life habits to assess disease susceptibility. Even though the understanding of the human genome is not completed, collection of samples shows that existing genomic data can be used effectively in medical area. Today, genome sequencing has the greatest impact on the classification of cancer, the characterization of genetic disease, and offering data about the possible response of an individual to treatment (Guyer and Collins 1995; Rossiter and Caskey 1995; Siniscalco 1997).

Integration of genomic and clinical information

The molecular tools used in the Human Genome Project have made it possible to identify many genes which are directly responsible for human inherited diseases and will allow for the identification of other genes which predispose to most human diseases. The human genome project enables the identification of new genes related to various diseases and provides today a database to better study the functioning of the human organism. The interpretation of these genetic data, thanks to the development of genomics tools, will make it possible to create new drugs, to develop new treatments, to develop diagnostic tests and innovative vaccines (van Ommen 2002; Bloss et al. 2011).
DNA-based diagnostic procedures targeted at specific susceptible populations will lead to early diagnosis and more cost-effective preventive measures and early treatments. Presently, some

countries including Iceland, Netherlands, United Kingdom, Japan and Sweden have carried out national genome researches on their inhabitants to define the genetic background of their populations lived in the country (Table) (Mattick et al. 2014; Stark et al. 2019). Turkey initiated very recently its own national genome project to obtain results on the preventive, diagnostic and therapeutic aspects of many conditions, particularly various types of cancer and rare diseases. This project provides unique scientific approach due to its comprehensive content. Turkish Genome Project contains transcriptome, proteome, metabolome and metagenome as well as genome analysis of individuals, simultaneously. Analysis of genomic information can make it possible to understand the genetic distribution of traits or disorders in the population and this data can be used in medical care system. The integration of multiomics approach to the national genome projects ensure the ideal data for improving or exploring in medical area.

Table. Current National Genome Projects (Stark et al. 2019)

Country	Year	Projects
United Kingdom	2012-	Genomics England Scottish Genomes Weish Genomics for Precision Medicine Northern Ireland Genomic Medicine
United States of America	2007- 2016-2025	National Human Genome Research All of Us
Brazil	2015-	Brazil Initiative on Precision Medicine
Saudi Arabia	2013-	Saudi Human Genome Program
Qatar	2015-	Qatar Genome
Switzerland	2017-2020	Swiss Personalized Health Network
Netherlands	2016-2025	RADICON-NL
Japan	2015-	Japan Genomic Medicine Program
France	2016-2025	Genomic Medicine Plan
Estonia	2000-	Estonian Genome Project
Finland	2015-2020	National Genome Strategy
Denmark	2012- 2011-2017	Genome Denmark Far-Gen
Turkey	2017-2023	Turkish Genome Project
China	2014-	China Precision Medicine Initiative
Australia	2016-2021	Australian Genomics

Epidemiological studies are required for learning the frequency of gene variants that may contribute to increase in tendency of disorders in the population. The sequence information will facilitate identification of genetic factors that vary from person to person and play a role in susceptibility to disease and response to treatment. Many diseases such as diabetes or cancer are based on genetic factors but because these factors interact with environmental factors, the disease has a more complex basis (Khoury 1997; Collins 1999). Nowadays we can understand the molecular mechanisms of these diseases through the data obtained from genetic studies. The interaction between environmental components and genetic factors involved in diseases can be identified by these investigations. This could promote newer treatment methods and more effective prevention strategies. Also, this information is needed to evaluate sensitive and specific genetic tests, improving predictive clinical importance of disease associated risk factors. As genetic tests are further developed, their contribution to existing medicine will increase gradually (Yang et al. 2000). Advances in genomics will guide us towards predictive medicine, which is much more focused on prevention than treatment. Early diagnosis of a disease such as breast cancer can increase the effectiveness of treatment and the likelihood of much more survival.

Genomics also has the potential to target drugs based on the genetic makeup of an individual. This possibility will play a critical function in the future development of drugs. Medicine will become personalized because diagnostic kits will be based on biology, not symptoms. It follows that pharmaceutical treatments will gain a lot of efficiency because we will know which individuals react to which drugs, it is a care approach, predictive, preventive and personalized. This approach has been developed for pharmacology and is now finding a new application in the

field of human nutrition, it is nutrigenomics. This approach could lead to a personalized diet by determining how the specific genotype of each individual influences its physiological response to nutrients and acting on these individual reactions for the health benefit of individual (Nathaniel Mead 2007; Sales, Pelegrini, and Goersch 2014).

CONCLUSION

Today, genome-based technologies are widely used in the area of biology, medicine and clinical practice. Information obtained by genomic analysis offers novel possibilities for the improvement of therapeutic strategies, management of health and prevention of diseases. The scientific communities in the world is now aware of the opportunities offered by this genomic medicine and seeks innovative technologies. It is therefore the pharmaceutical industry most interested in the development of this science. The application of the outputs of the genome researches to the epidemiology and the prevention of human disease is still in its infancy, and much further study will be needed before recommendations for specific diseases can be made. Moreover, the use of genetic testing for disease prevention brings ethical, legal and social problems. Therefore, it is an area that needs to be carefully considered and applied. However, the promise for cost effective prevention and early treatment of diseases is great and the future looks bright.

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ORAL Fulltext PRESENTATIONS (OFP)

OFP1-Detection of Cystic Fibrosis Gene Mutation by using Biosensor-based Electrochemical Diagnostic Kit

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Abstract: This study presents a newly developed disposable DNA biosensor based on magnetic beads for sensitive and rapid analysis of Delta F508 (ΔF508del) Cystic Fibrosis (CF) gene mutation. The developed diagnosis kit contained streptavidin-coated magnetic beads (MBs) which was used as a DNA carrier and disposable screen printed carbon electrodes (SPEs) as an electrochemical transducer. First, the biotin-labeled short DNA sequence (probe) representing the Cystic Fibrosis Gene Mutation was immobilized onto the MBs and they were placed in the refrigerator as a "diagnosis kit" until use. The probe coated MBs kit was then interacted with the target Cystic Fibrosis DNA and the detection of hybridization between probe and target sequences was performed by using enzymatic or label-free detection protocols. Differential pulse voltammetry (DPV) was used for electrochemical monitoring of alpha naphthol and guanine signals. The developed biosensor kit was able to analyze the related gene sequences even after 6 months with 0.5 picomol detection limit in 30 min detection time.
Keywords: Electrochemical DNA biosensor; diagnosis kit; Cystic Fibrosis (CF) gene mutation.

Introduction: One of the autosomal recessive disorder "Cystic Fibrosis (CF)" occurs caused by mutations in the Cystic Fibrosis Transmembrane Regulator (CFTR) gene. The delta F508 (F508) is the most famous mutation for this disease which is a 3-nucleotide deletion on Exon 1 in related protein[1]. Many of standardized analysis techniques have been used for the detection of CF for example, sweat tests[2], gel electrophoresis[3], microarray systems[4] etc. In addition to these methods, powerful alternative testing techniques such as electrochemical nucleic acid sensors have still been developed to identify many genetic diseases in biomedical field[5-7] because these systems have the potential for micro-fabrication and point-of-care analysis. The basic aim of this work was to show a magnetic bead-based kit type DNA genosensor for the detection of Cystic fibrosis gene mutation which is suitable to practical use for medical diagnosis field.
Materials and Method: Electrochemical workstation AUTOLAB 12 and its software package GPES 4.9 (General Purpose Electrochemical System) were used in this study. Screen-printed electrodes(SPE) were obtained from Dropsense(Spain). Invitrogen Dynal bead separator device and streptavidin-coated magnetic beads were purchased from Invitrogen Dynal AS, Norway. Streptavidin-alkaline phosphatase(ALP) conjugate and alpha-naphthyl phosphate were purchased from Sigma. In the experiment, a biotin contained DNA probe was immobilized to the magnetic beads and then hybridization was performed with the target DNA on the MBs surface. After that, a specific conjugate "streptavidin-ALP" was interacted with the biotinylated hybrid structure, thus the alpha naphthol signal was occurred due to the hybridization event. Hybridization signal was displayed by differential pulse voltammetry in the PBS aliquot before and after hybridization by scanning from +0.70 to +1.40V with an amplitude of 50 mV at 16 mV/s scan rate. The DNA-modified MBs were monitored using a JEOL JEM 1400 Plus Transmission Electron Microscope (TEM) instrument (Japan) operated at 120 kV accelerating voltage. Prepared specimens were diluted (1:1) with deionized water and deposited on 300 mesh carbon supported copper grids.
Results and Discussion: The microscopic investigation of biotin-tagged DNA modified MBs kit was showed in Figure 1A by using Transmission Electron Microscopy (TEM). According to the TEM image of the developed kit, small structures were observed around streptavidin-coated MBs thus the thickness of the related layer show an increment due to biotinylated probe DNA binding to the MBs surface. Selectivity study.—In this study we use kit type MBs (3 months storage at +4◦C). The selectivity of the developed MBs based diagnosis kit was tested with non-specific DNA (Figure 2b) and three base-mismatch (Figure 2c) contained DNAs. According to the results, the highest signal was observed in the presence of the target (fullmatch) sequence (Figure 2d). However, when experiments with other DNA sequences such as mismatch (Figure 2c) and

noncomplementary (Figure 2b) were repeated, very low signals were observed. Thus the developed diagnostic kit shows perfect selectivity even after three months of kit preparation (The RSD of hybrid response was about 5%).

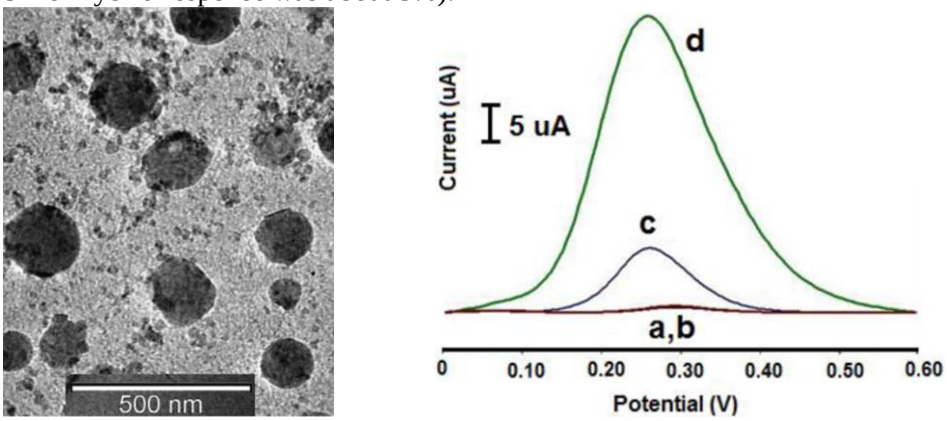

Figure 1. TEM images of the bio-probe DNA modified MBs kit and the Differential pulse voltammograms of alpha naphthol related to analysis results of CF obtained from 3-month MBs kit. a. probe, b. non complementary, c. mismatch (three bases), d. target(hybrid). The DPV measurements was performed at SPE surface by scanning the potential range between +0.10 and +0.60 V at 5 mV step potential and 70 mV modulation amplitude.

The obtained hybridization response was nearly 48-times higher than non-specific and 5-times higher than mismatch DNA binding signal. The proposed diagnostic kit has been proven to successfully detect cystic fibrosis DNA in a sensitive and selective way. detection limit was calculated as 12.4 nM (equal to 0.5 pmole in 45 µL of reaction volume).

Conclusion: In this study, a rapid response kit type genosensor was developed especially for medical tests requiring fast and easy detection. The developed diagnosis kit reached high detection/ discrimination rate in 30 min analysis time without any other complex or time-consuming experimental steps. The developed kit has 6 months of stability, it is a portable device, and its transducer is disposable. Because of all these advantages, the developed system seems to be one of the promising ones for the development of DNA chips for future point-of-care diagnostic systems, microarrays and the detection of real samples in medicine.

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OFP2-Time and dose dependent cytotoxic effects of fructose on rat hepatocytes

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Abstract: This study was conducted to evaluate in vitro cytotoxic properties of fructose on healthy rat hepatocellular cells in time and dose dependent manner. XTT cytotoxicity results revealed the amount of fructose which reduced the viability of Clone 9 cells by 50% (IC_{50}). For 24-hour incubation IC_{50} value was calculated as 172.50±1.34 mM, while it was 101.20 ± 1.17 mM for 48-hour treatment. Real-time cell analysis results demonstrated time dependent growth kinetics of rat hepatocytes under different fructose concentration. Accordingly, at low doses (25-50 mM) there was a slight decrease in cell number over a very short period of time, but cells approached the growth dynamics of the control cells within two hours. The effects of high doses (150 mM, 200 mM and 250 mM) were more pronounced and dramatic such that 150 mM fructose reduced cell viability by 80% and 200- and 250-mM fructose completely terminated cell viability within two hours.

Keywords: *Fructose; rat hepatocytes; Clone9; cytotoxicity; real time cell analysis*

Introduction: The high chronic consumption of fructose is associated with several health concerns one of which is the metabolic syndrome[1,2]. Recent studies demonstrated persuasive evidence that diets rich in high fructose cause hyperinsulinemia together with vascular and hepatic insulin resistance in animal models[3]. However, there has been much less direct experimental data that fructose has direct cytotoxic effects on hepatocytes. With the aim of investigating cytotoxic properties of fructose on liver cells, we performed in vitro cell toxicity assay together with real time cell analysis of Clone9 cells upon different dose and time of fructose administration.

Materials and Method: Healthy rat liver hepatocyte cells (CRL-1439 ™) from which the in vitro effects of fructose were investigated were purchased from ATTC (Wesel, Germany). Purchased stock cells were grown in F-12K medium (Kaighn's Modification of Ham's F-12 Medium, ATCC® 30-2004 ™, ATTC, Wesel, Germany) containing 10% fetal bovine serum (FBS) and 1% penicillin / streptomycin upon arrival. The growth of the cells was continued in a 37ºC incubator (Sanyo MCO 17AIC, USA) having 95% humidity and 5% CO_2 until it reached 90% confluence. Cells removed with trypsin / EDTA solution were divided and transferred to new growth media for the experiments.

The XTT cytotoxicity test, which was optimized in our laboratory, was used to investigate the in vitro cytotoxic effects of fructose on Clone 9 cells. In the method, cells stained with Trypan blue were counted in a cell counting device (TC-10, Bio-RAD, Germany) and seeded in 96-well culture plates at a cell density of $5x10^{+4}$ cells /well /100 µl. Then, 50 µl of different doses (2-250 mM in the well) of fructose prepared in F-12K medium was added to the cells which were kept in the incubator for six hours to adhere to the surface. After 24 and 48 hours of fructose treatment, 25 µl of XTT reagent (1 mg/ml XTT, 25 µM PMS) prepared in F-12K medium was added to the cells and incubation was performed for an additional two hours. After reading the absorbances at 450 nm in the spectrophotometric microplate reader (MultiScanTM Go, Thermo Scientific, USA), IC_{50} values were calculated

Time dependent growth dynamics of Clone 9 cells and effects of fructose on Clone 9 cells were also analyzed using a real-time cell analysis system (xCELLigence RTCA S16, ACEA Biosciences, USA). In this method, Clone 9 cells ($1x10^{+4}$ cells / 100 µl F-12K medium) were seeded to the wells of 16-well E-plates of xCELLigence system and treated with fructose in different concentrations (25-250 mM). During this process, the real-time growth dynamics of the cells were measured instantly throughout 72-hours.

Results and Discussion: When the XTT cytotoxicity results are examined, 24-hour low-dose (5-60 mM) fructose increased the viability of Clone 9 cells, but this increment is apparent with only low doses (2-20 mM) at 48-hour application (Figure 1). Cell viability started to decrease from 80 mM fructose at 24 hours, whereas it began to decrease at 40 mM after 48 hours. The amount of fructose which reduced the viability by 50% (IC_{50}) was calculated as 172.50 ± 1.34 mM for 24-hour incubation, while this value was 101.20 ± 1.17 mM for 48-hour treatment.

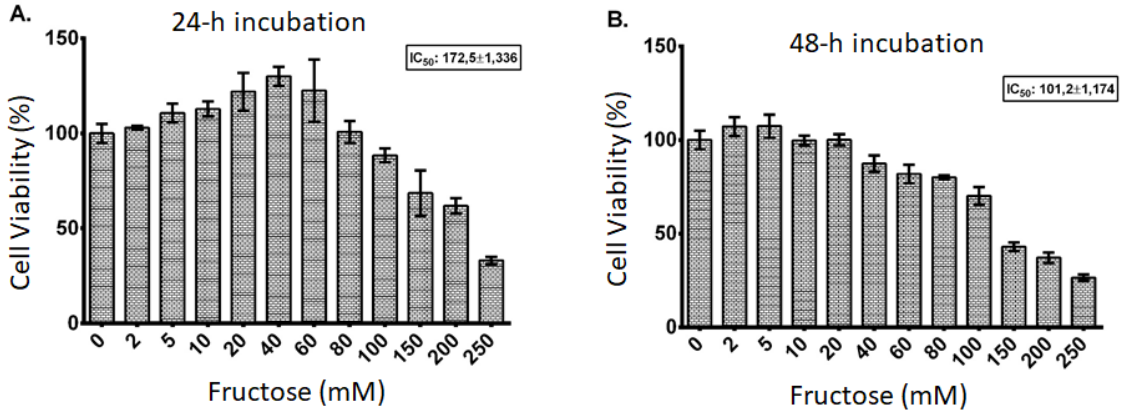

Figure 1. Cytotoxic effects of fructose on Clone 9 cells. A. Effects of 24-hour fructose administration on cell viability, B. Effects of 48 fructose administration on cell viability.

Real-time cell analysis results demonstrated any significant effects of low-dose fructose (25 and 50 mM). Although there was a slight decrease in cell number, over a very short period of time, cells approached the growth dynamics of the control cells within two hours. The effects of high doses of fructose (150 mM, 200 mM and 250 mM) were more pronounced and dramatic. Accordingly, 150 mM fructose reduced the cell viability by 80% and 200- and 250-mM fructose completely terminated cell viability within two hours.

Conclusion: Even though low doses and incubation times of fructose speeds up the cell growth, after 100 mM and higher, hepatic cells' viability decreased tremendously even within a very short period of time.

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OFP3-How to Use Metabolomics on Preventive Medicine

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Abstract: Metabolomics is the vast scale investigation of little particles, generally known as metabolites, inside cells, biofluids, tissues or life forms. These little particles and their connections inside an organic framework are known as the metabolome. Similarly, as genomics is the investigation of DNA and hereditary data inside a cell, and transcriptomics is the investigation of RNA and mRNA articulation; metabolomics is the investigation of substrates and results of digestion, which are impacted by both hereditary and ecological components. Metabolomics is a relatively new methodology since metabolites, dissimilar to other "omics" measures, straightforwardly mirror the basic biochemical processes and condition of cells/tissues. Accordingly, metabolomics best speaks to the molecular phenotype. Due to the fact that phenotype is directly related with lifestyle, metabolomics could be used on preventive medicine by monitoring the metabolism simultaneously. Thus, preventive medicine could be applied through metabolomics applications. In this study, the results of some metabolomic studies performed in our laboratory are presented to show the application of metabolomics on preventive medicine.

Keywords: metabolomics, preventive medicine, personalized medicine, phenotype, metabolomics workflow

Introduction: Systems biology is the computational and mathematical modeling of complex biological systems. Omics analysis for the system biology is the analysis of entire gens, proteins and metabolites of a cell, tissue, or organism under a specific, defined set of conditions and combine the data to understand the metabolic pathways effected due to the specific conditions like diseases, drug treatment, etc. Metabolomics is one of the main areas to understand cellular process at molecular level by analyzing metabolites. In recent years, metabolomics has been emerged as key tool to understand molecular basis of disease, find diagnostic and prognostic biomarkers, and develop new treatment opportunities and drug molecules. In this study, a step by step procedure is described to evaluate the results of metabolomics studies and the results of our previous studies are used to describe the procedure. Thus, the usage of metabolomics on preventive medicine is shown through real examples.

Materials and Method: In the first step of metabolite profiling experiments, it is primarily focus on finding possible metabolite peaks affected by the disease, but not the identification of the whole peaks. Chromatograms taken from LC-MS instrument are raw data and the bioinformatics data inside it should be extracted. For this purpose, raw data files were converted to .mzml format via ProteoWizard software (http://proteowizard.sourceforge.net). Peak picking, grouping and comparison parts were performed (metabolite profiling) via XCMS (https://xcmsonline.scripps.edu/) software [1]. XCMS is an 'R software' based, freeware program used for peak picking, grouping and comparing the findings. XCMS has many parameters for optimization. Furthermore, Isotopologue Parameter Optimization (IPO) is a software which automatically optimizes XCMS parameters [2]. The optimized parameters are subjected to XCMS. XCMS results should be modified in MS Excel in our data analysis process. For this purpose, the prior step is to eliminate the "ghost peaks" and peaks having threshold under noise. A series of statistical and regression analysis were performed on consecutive dilution of samples according to the literature [3]. The peaks having $R < 0.90$ value is removed from the sample set and evaluated as 'ghost peaks' coming from noises. The remaining 'reliable' peaks are considered to be evaluated on metabolite profiling. Then, a normalization process for the peak intensities are performed. The total area of all reliable peaks for each injection are summed and the whole peak areas are divided to the total area of peaks for each injection [4]. The final peaks eliminated and normalized are compared within each other to understand the peaks affected due to the conditions.

The extracted peaks on un-targeted metabolomics studies are statistically evaluated and having fold change >1.5 are uploaded into Metaboanalyst (https://www.metaboanalyst.ca/) to match the m/z values of peaks with metabolites. 'MS Peaks to Pathways' utility of Metaboanalyst matchs the peaks with metabolites. In this matching process, [M+H]+, [M+2H]+ and [2M+H]+ adducts are considered to found matched metabolites. In order to perform metabolic pathway analysis, matched metabolite list according to the Metaboanalyst results are uploaded into Metaboanalyst 'Pathway Analysis' tool and Reactome (https://reactome.org) analyze data utility.

Results and Discussion: According to the experimental procedure given in the materials and method section, the pathway analysis was performed in some of our studies. Based on the detailed procedure given above, the investigation on the blood samples of the patients having polycystic ovary syndrome (PCOS) and spontaneous premature ovarian insufficiecy (POI) in our previous studies were given as an example of this step by step procedure. Obtained data in these studies show that sphingosine, dehydrosphinganine and pregnenolone levels found to be reduced in PCOS samples. Phenylalanie and Decanoyl-L-carnitine levels found to be reduced in POI samples. Such results could be used to rearrange the metabolism of the patients against disease conditions. Apparent changes in metabolome level shows us how the disease condition affects the metabolism of the patients and how we can force these changes to turn back to the normal conditions. These results basically provide the information about the fact that the metabolomics workflow given in this study is not only a diagnostic tool to find biomarkers on metabolome level but also a key component to arrange the lifestyle and diet of potential patients to prevent them from specific diseases.

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OFP4-Determination of the polycyclic aromatic hydrocarbons formed during deep fat frying process

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Abstract: Deep fat frying is a cooking technique known to everyone and especially used more often in the food industry. Deep-fat frying can be defined as a process of cooking foods by immersing them in edible oil at a temperature above the boiling point of water, usually 150-200 ^{o}C[1]. In this process, transfer of heat and mass occur concurrently. During transfer of heat from oil, water evaporates from food and it absorbs the oil. Therefore, both fried material and frying oil influence on each other and collectively promote the occurrence of complex chemical reactions such as hydrolysis, oxidation and polymerization. Due to high heat conduction by oil, the desired taste, smell, color and crisp appearance in the food is obtained. During frying, it is known that substances which can be harmful to health such as polycyclic aromatic hydrocarbons (PAH). PAH are defined as organic compounds that possess two or more fused aromatic rings of carbon and hydrogen atoms. They are characterized by their hazardous carcinogenic and mutagenic potential[2]. Due to the lipophilic and hydrophobic characteristics of PAHs, they tend to accumulate in the food chain. Dietary intake is one of the major exposure pathways of PAHs[3]. In this study, the effects of frying time of palm oil on the levels of PAHs (Benzo (a) pyrene, Benzo (a) anthracene, Benzo (b) fluoranthene and Chrysene) in both frying oil and fried bakery product were investigated. PAH concentrations were quantified via high performance liquid chromatography (HPLC). The results show that PAH concentrations in the frying oil and fried product increased with increasing frying time. The concentration of benzo[a]anthracene was determined as the highest PAHs in all samples. Average levels of ΣPAH (consisting of benzo[a]anthracene, chrysene, benzo[b]fluoranthene, and benzo[a]pyrene) were mostly below the maximum permitted limit by the Codex Alimentarius and Turkish local food standards.

Keywords: PAHs, deep fat frying, bakery product

Introduction: It is well known that deep-fat frying is a prevalent and old food cooking method. Deep-fat frying is a complicated physicochemical processes which is simultaneously influenced by many factors such as the nature of fried material and frying oil, time, temperature, intermittent or continuous heating, fresh oil complement, fryer model and use of filters. Therefore, many products are formed due to these complex substrates and chemical conditions. Furthermore, frying with food and frying without food have a significant different chemical in reaction pathways.[2] Polycyclic aromatic hydrocarbons (PAHs) are a large class of organic compounds that are produced through the incomplete combustion or pyrolysis of organic and are persistent, bio-accumulative, carcinogenic and mutagenic, lipophilic contaminants.[3] Due to the lipophilic and hydrophobic characteristics of PAHs, they tend to accumulate in the food chain. The occurrence of PAHs in food can be ascribed to diverse pathways that include both natural (as environmental) and synthetic sources (e.g. cooking practices and industrial food processing).[4] Efficient pathway of PAH intake is majorly attributed to manmade activities in the form of cooking (grilling, roasting, and frying) and processing (performed at industrial level). The efficiency of this route is dependent on various factors such as heat source, distance of heating, design of the food device, and type of fuel, which can further help foster the production of PAHs in food products. Thus, cooking processes play an inevitable role in the formation of PAH which tends to proceed with chemical distortion of the original nutrient contents in foods (e.g., proteins, carbohydrates, and lipids). The EU commission (2011) established regulation guidelines for the maximum levels of PAH4 (Benzo[a]pyrene, benzo[a]anthracene (BAA), chrysene (CHY) and benzo[b]fluoranthene (BBF)) in food matrices.

Materials and Method: Traditional baker product and palm oil were obtained from a local producer. The ingredients for bakery product included wheat flour, salt, egg, yogurt, vegetable oil and sugar. The prepared product was fried at 165-170ºC for 8 ± 2 minutes. The frying process

was continued until Total Polar Materials value was 25 (Anonymous 2012). The PAHs (Benzo (a) pyrene, Benzo (a) anthracene, Benzo (b) fluoranthene and Chrysene) content of the samples were analyzed by BS EN ISO 15302 (ISO, 2017). The Quachers method for determining PAHs levels was the procedure described by Wong et al. (2017), with some modifications. PAHs were analyzed using a Shimadzu RF20A HPLC equipped with a Flueresans detector. Chromatographic compound separation was achieved using a GL Sciences Reverse Phase Inertsil ODS-P chromatographic column (250 mm, 4.6 mm x 5µm). A mobile phase composed of acetonitrile (A) and water (B) at a flow rate of 1.2 mL/min was used to separate the PAHs. The injection volume was set to 10 µl, and the emission and excitation were set to 450nm and 330 nm, respectively.

Results and Discussion: The PAHs analysis method performance characteristics are shown in Table 1.

Table 1. PAH analysis method performance characteristics

PAH Compound	RT (dk)	Lineer Range(µg/l)	Correlation (r^2)	LOD (µg/kg)	LOQ (µg/kg)	Repeatability (%)	Recovery (10 ppb)
Frying Oil							
BaA	17.993	0.1-100	0.9997592	0.06	0.19	0.8	103
CHR	18.948	0.1-100	0.9996724	0.08	0.25	1	111
BbF	22.892	0.1-100	0.9999232	0.02	0.06	0.2	75.8
BaP	26.083	0.1-100	0.9997922	0,1	0,33	1.3	97.3
Bakery product							
BaA	17.993	0.1-100	0.9997592	0.11	0.38	0.8	101.5
CHR	18.948	0.1-100	0.9996724	0.15	0.5	1	103.3
BbF	22.892	0.1-100	0.9999232	0.03	0.11	0.2	88.8
BaP	26.083	0.1-100	0.9997922	0.2	0.65	1.3	121.6

PAH content of frying oils and fried bakery product for different sampling period and Chromatogram of BP1.6 exposed to heat treatment for a long time are shown in Table 2 and Figure 1, respectively.

Table 2. PAH content of frying oil and fried bakery product for different sampling period

Sample	PAH (µg/kg)				
	BaA	CHR	BbF	BaP	∑PAH
Frying Oil					
Control	0,94±0,04	0,63±0,01	0,63±0,16	<LOQ	2,20 ±0,20
Y1.1	2,02±0,04	1,31±0,07	0,37±0,01	0,38±0,06	3,14 ±0,10
Y1.2	2,06±0,07	1,34±0,08	0,45±0,16	0,47±0,06	3,43 ±0,10
Y1.3	2,34±0,34	1,47±0,12	0,50±0,04	0,60±0,06	3,94 ±0,20
Y1.4	2,52±0,06	1,55±0,44	0,97±0,03	0,64±0,03	5,08 ±0,10
Y1.5	2,38±0,05	1,48±0,01	1,04±0,01	0,61±0,02	5,07 ±0,10
Y1.6	3,95±0,20	0,99±0,01	0,72±0,01	0,96±0,01	6,35 ±0,20
Bakery product					
Control	1,25±0,24	0,29±0,04	0,49±0,01	0,64±0,02	2,91 ±0,2
BP1.1	1,32±0,10	0,29±0,01	0,84±0,03	0,82±0,02	3,80 ±0,1
BP1.2	1,58±0,02	0,30±0,01	0,99±0,01	0,70±0,01	4,22 ±0,1
BP1.3	1,60±0,04	0,29±0,01	1,00±0,08	0,68±0,02	4,34 ±0,1
BP1.4	2,14±0,01	0,34±0,06	0,71±0,03	0,88±0,02	4,41±0,1
BP1.5	2,28±0,32	0,40±0,09	0,75±0,04	0,80±0,10	4,60 ±0,3
DP1.6	2,20±0,30	0,66±0,10	0,69±0,10	1,09±0,03	4,73 ±0,4

The results show that PAH concentrations in the frying oil and fried bakery product increased with increasing frying time. The concentration of benzo[a]anthracene was determined as the

highest PAHs in all samples. Average levels of ΣPAH (consisting of benzo[a]anthracene, chrysene, benzo[b]fluoranthene, and benzo[a]pyrene) were mostly below the maximum permitted limit by the Codex Alimentarius and Turkish local food standards. During the frying time and due to the oxidation, the deterioration parameters of the frying oil increased.

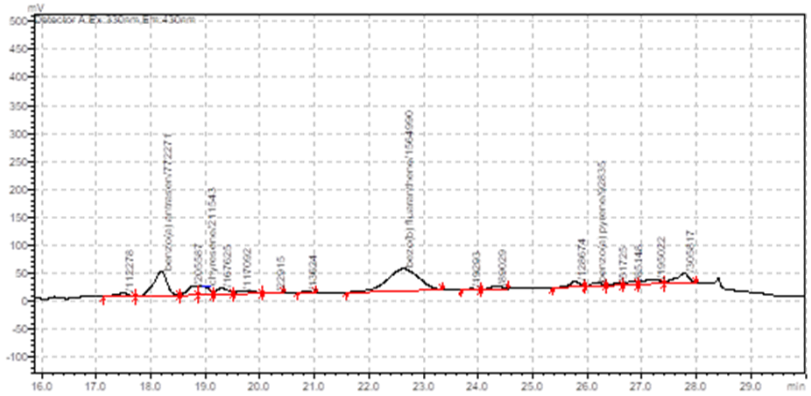

Figure 1. Chromatogram of BP1.6

Conclusion: This study reported on changes in PAHs, which is thermal process contaminants, in frying oils and traditional fried bakery product during the deep-fat frying process. All parameter contents increased as frying time increased. From a food safety point of view, the occurrence of PAHs in foods is important concerns for consumers, health authorities and food industry. For this reason, it is necessary to monitor the presence of these compounds in foods and to determine the changes in concentration during the frying process.

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OFP5-The Effects of a Food Industry by-products Coffee Silverskin on Kefir Microbiota

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Abstract: Kefir is a fermented dairy product, which is produced by the action of lactic acid bacteria (LAB) and yeasts, consumed in many regions of the world because of its nutritional and functional potential.[1] Coffee is one of the most valuable primary products in world trade due to the high consumption of the coffee beverage; also significant amounts of residues are generated. Coffee silverskin is a residue with high concentrations of dietary fiber and protein and also low level of lipids and proposed as a new potential functional ingredient due to the prebiotic and antioxidant capacity.[2] In this study it was aimed to determine the effects of adding the coffee silverskin on microbial growth of LAB and yeast flora of kefir. It this study, different types of kefir samples were produced by using non-fat milk and whole milk (3% fat). Thus, two types of kefir starter cultures were prepared in three different concentrations (0.50, 0.75 and 1.00%) with coffee silverskin. After inoculation of kefir cultures, the samples were incubated at 22-25°C for 24 hours. LAB and yeasts counts were determined during the storage conditions at 4°C for 28 days. M17 agar, MRS agar, and Sabouroud Dextrose agar media were used for counting lactoccoci, lactobacilli and yeasts, respectively. It was found that incorporation of coffee silverskin into the kefir samples showed positive effects on growth of LAB counts and sensory characteristics of kefir were also improved due to silverskin incorporation.
Keywords: Kefir, coffee silverskin, functional food

Introduction: Kefir is a unique fermented dairy product, originally made in the Balkans, Eastern Europe and the Caucasus, that is produced by a mixture of LAB and yeast. It is traditionally produced by inoculating milk with grains of kefir. The industrial manufacture of kefir using grains as the starter culture is very difficult due to the complexity of their microbiological composition, which varies widely depending on the origin of the grains and conditions of storage and handling. Thus, the starter culture is used and preferred to obtain a high-quality product with consistent characteristics instead of the kefir grains. Kefir characteristics are affected by the number of microorganisms, combination of the species and their proportion in the starter mixture [3-5]. Kefir is known as a healthy drink, and it has been studied about its protective effect on cell damage. The other benefits of kefir in the diet are reported to possess the antibacterial, immunological, antitumoral, and hypocholesterolemic effects[3-4]. There are several studies conducted about enrichment of kefir by prebiotics, phenolics, selenium, vitamin B_{12}, folate, dietary fiber, inulin, maltodextrin and various herbs etc[6-11]. Coffee is the most important food commodity worldwide and most coffee beverages are consumed around the world, are produced by the species *Coffea arabica* (Arabica) and *Coffea canephora* (Robusta). Coffee silverskin is a residue which can be easily found during coffee processing in coffee roasting plants and it is also recommended the using as functional ingredient, based on the low amount of fats and reducing carbohydrates, high contents of soluble dietary fiber (60%), it has a natural source of bioactive compounds, such as chlorogenic acid, caffeine, melanoidins and antioxidant activity. It is also mentioned that coffee silverskin supports the growth of bifidobacteria *in vitro*, and it has been proposed as a new potential functional ingredient due to the prebiotic and antioxidant capacity[12-14].
In this study, it was aimed to determine the effects of coffee silverskin on microbial growth of LAB and yeast flora of kefir.

Material and Methods: It this study, different types of kefir samples were produced by using non-fat milk and whole milk (3% fat), two types of kefir starter cultures and included three different concentrations (0.50, 0.75 and 1.00%) of coffee silverskin. After the inoculation of kefir cultures, the samples were incubated at 22-25°C for 24 hours and then they were analyzed the numbers of LAB and yeasts during storage conditions at 4°C for 28 days. Each sample (10 mL)

was aseptically taken from kefir samples and homogenized with 90 mL of 0.1% (w/v) sterile peptone water for 1 min. and decimal dilutions were prepared. M17 agar, MRS agar, and Sabouroud Dextrose agar media were used for counting LAB and yeasts, respectively[4-5, 15-16].

Results and Discussion: The colony counts of the kefir samples that were contained silver skin in three different concentrations (0.50, 0.75 and 1.00%) and the control (kefir without coffee silverskin), were determined as 10.6 log cfu/mL, 10.1 log cfu/mL, 9.7 log cfu/mL and 10.0 log cfu/mL for LAB. The yeast counts for the same samples were 5.5 log cfu/mL, 5.8 log cfu/mL, 6.1 log cfu/mL and 5.3 log cfu/mL, respectively.

Conclusion: As a result, it was found that addition of coffee silverskin to kefir samples showed positive effects for both LAB counts and also sensory characteristics of kefir.

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OFP6-Complementary Therapy With Essential Oils: Aromotherapy

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Abstract: Nowadays, use of alternative and complementary therapies has gained importance and it has become widely used among the public. Aromatherapy is one of the complementary therapies which use essential oils as the major therapeutic agents to treat several diseases. Essential oils are volatile, strongly odorous and oily mixtures obtained from plants or plant drogs by distillation of water or water vapor. They are used in flavors, fragrances, and in aromatherapy for health purposes. In aromatherapy; essential oils are used by inhalation, massage or simple applications on the skin surface and rarely they are take internally. Aromaterapy is classified as cosmetic, massage, medical, olfactory and psycho-aromatherapy. Many plants have been reported to use in aromatherapy due to presence of essential or volatile oils in different plants' materials like flowers, barks, stem, leaves, roots, fruits, etc. Aromatherapy is uses bacterial, virucidal, fungicidal, antiparasitical, insecticidal and antioxidant effects of essential oils. It is suggested that essential oils is useful for the diseases like alzheimer, cardiovascular, cancer, sleep disorder. According to aroma therapist; synthetic odor does not match the essential oils, this is the matter of debate between odor phychologist and biochemist.

Keywords: Complementary therapy, Aromaterapy, Essential oils

Introduction: Aromatherapy derived its name from the word aroma, which means fragrance or smell and therapy which means treatment. Aromatreapy is used essential oils for the treatment of various diseases. Since ancient times the therapeutic properties of essential oils have been known, At the beginning of 20th century, French chemist Rene Gattefosse found that small molecule oils penetrate the skin barriers. Small molecules of essential oils penetrate to the lower layer of skin though hair follicles. In normal skin, it spreads through body and organs by blood within few minutes. This invention has been very important step for aromatherapy and aroma-cosmetics.[1]

An essential oil is a volatile material derived by a physical process from odorous plant material of a single botanical form and species which it agrees in name and odor. Essential oils extracted different part of the plants (such as flower, buds, leaves, stems, seeds, fruits, roots, barks) generally by stream distillation or cold press. They are used for sweetening agent in food and beverages, fragrance and aroma in cosmetics especially in perfume and skin creams.[2]

Essential oils have been largely employed for their properties already observed in nature for their antibacterial, antifungal and insecticidal activities. Essential oils help digestion, increase secretions, regulate blood circulation.[3] Anti-inflammatory, antiviral, anti hyperglycemic, antitumoral, anticarcinogenic and antioxidant properties of the essential oils have been scientifically proven by several studies. Nowadays there is an increased trend to use aromatherapy in alzheimer, cardiovascular, cancer and labor pain in pregnancy.[2,4]

Another aspect of aromatherapy is odor psychology. It is used to treat emotional disorders, such as stress and anxiety, but has wider applications, including the alleviation of pain and nausea and the promotion of sleep. The mechanism of essensial oils action involves integration of them into biological signal of the receptor cells in nose when inhaled. The signal is transmited to limbic and hypotalamus parts of the brain via olfactory bulb. These signals cause brain to relase seotonin, endorphine.[2] Aside from the perceived benefits to health and well-being, aromatherapy is popular because it is non-invasive, relatively inexpensive, readily available, pleasant to use and can be self administered without prior consultation with a healthcare professionals or natural therapist.[5]

Classification of aromatherapy[2]

Aromatherapy can be classified in five section. But all of them intersect eachother.

1. Cosmetic aromatherapy: This therapy utilizes certain essential oils for skin, body, face and hair cosmetic products. These products are used for cleaning, moisturizing, drying and toning. The essensial oils have been largely employed for their antibacterial, antifungal, and insecticial properties.[3] Rosemary, lavander, eucolyptus and clove has also antioxidant properties.[6] Full body or foot bathing with adding few drops of appropriate oil is also accept in the cosmetic aromatherapy.[2,5] Different essential oils can be used as cosmetic aromatherapy. For example: As a cosmetic product; for normal skin lavender, rose; oily and cobination skin citrose, myrtle, problematic skin (acne), myrtle, lemon, dry skin carrot seed, rose, irrirated skin rose geranium, cellulite orange, juniper, rosemary can be used. Rosemary oil is used for antiaging while rose oil is used for antiaging, antibacterial and skin firming. Jojoba oil is good for reliefing aftershave. In anti-dandruff shampoo witch hazel oil is added for treatment.[7]

2. Medical aromatherapy: Skin constantly is exposed to environmental oxidative stressors such as ultraviolet radiation, air pollutants, chemical oxidants and aerobic microorganisms. Reactive oxygen species (ROS) are consider major contributors to skin aging, cancer and certain skin disorders. Rene-Maurice Gattefosse has used essential oils to massage patients during surgery.[5] Citral and citronellal sesquiterpens in essential oil have the strongest sedative effect. Phelypropan derivates have been sedative effect when taken orally.[6,7] Various kind of oils are used for medical treatments. Such as for anxiety; bergamot, rose, pelarganium flower, cedrus, lavender; for depression, jasmine, lemon, black pepper, bergamot, mint, rosemary, basil oils; for decreasing stress, bergamot, pelarganium flower, yiang yiang, chamomille, jasmine; for alzheimer mixture of rosemary, lemon, lavender and orange; for insomnia lavender, chamomille; for memory strengthen and focusing blackpepper, lemon and mint can be used.

3. Massage aromatherapy: Massage oil is intended to reduce the friction while massaging. It also smooths the skin surface and helps to easy work. Grape seed, almond, jojoba oil in pure vegetable oil during massage has been shown to have wonderful effects. For muscle pain and relaxation German chamomilla and eucalyptus oils can also be used. Chamomilla, juniper, coriander oils are used for their antiimflammatory benefits.[2,6,7]

4. **Olfactory aromatherapy:** Inhalation of essential oils has given rise to olfactory aromatherapy, where simple inhalation has resulted in enhanced emotional wellness, calmness, relaxation or rejuvenation of human body.[2]

5. **Psycho-aromathreapy**: In psycho-aromatherapy, certain states of moods and emotions can be obtained by these oils giving the pleasure of relaxation, invigoration or a pleasant memory. The inhalation of the oils in this therapy is direct though the infusion in the room of a patient. Some phychocosomatic disorders, negative affects and psychic effects can be treated with essential oils. Peel of citrus fruits' essential oil is used in this therapy because of its physiological effects. Psycho-aromatherapy has limited itself with study of natural essential oils.[5]

Ouality of essential oils: The quality of the essential oils which are used in aromatherapy is so important. The plants must harvest in correct season and correct time of day and must distill essential oils for superior therapeutic effect. All oils must be certified organic and pesticide free. The oils should never be denatured, reconstituted or mixed with other compounds, and should never have genetically modified organisms and artificial color, oils, additive scents or compounds of any kind. The quality control of the essential oils can be done with GCMS or Raman spectroscopy. This insures all correct therapeutic chemical components are present at the strict standard required for a true therapeutic effect.

Conclusion: Essential oils which have antiviral, antifungal, anti-iflammatory, anti-insecticidal, antidanruff, anti-tumor, antioxidant and hormonal effects. In addition to all these effects they also have features such as revitalizing, relaxing and calming the body. Aromatherapy which is using essential oils in treatment is natural and noninvasive gift of nature. It regulates the physiological,

spiritual and psychological upliftment for new phase of life. This therapy is not only preventive but also can be used in acute and chronic stages of disease. The most important thing is to use the right and quality certified essential oils. Essential oils are complemented to medicinal treatment and can never be taken as replacement for it.

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OFP7-Medical Leech Therapy (Hirudotherapy) and Adverse Effects

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Abstract: Medical Leech Therapy (MLT) or Hirudotherapy is a complementary and integrative treatment method applied with medical leeches. The application is based on very old times. It is known that the first application was made in ancient Egyptian civilization. When it was discovered that it caused infection in the 1900s, its usage was decreased. In recent years, medical leeches produced under sterile conditions are increasingly used in reconstructive surgery, pain management, and some other medical fields. In the retrospective analysis of the studies in which medical leeches were used to hold flaps and grafts, the success rate was found to be over 80%.
The reason for using medical leeches is that they release anticoagulants, vasodilators, thrombolytic, antiinflammatory, anesthetic, analgesic, and bacteriostatic bioactive substances to the tissue they absorb their blood. These bioactive compounds prevent hypoxia by increasing tissue vascular permeability, provide lower blood pressure and microcirculation. However, there are reported adverse effects and complications associated with MLT; infection and allergy are the most common. Allergy is related to leech type and bioactive components that vary in secretion. It has also been reported to cause orthostatic hypotension, vasovagal symptoms, prolonged bleeding, ecchymosis, various skin lesions, and regional lymphadenopathy.
Consequently, MLT is a valuable conventional technique with strong biochemical effects. In some medical conditions, its use should be assessed for adverse effects.

Keywords: Hirudotherapy, adverse effects, complications

Introduction: Therapy with leeches is one of the oldest minor invasive procedures in medicine. There are more than 700 leech species out of which the most frequently used species for therapeutic purposes were Hirudo medicinalis, Hirudo verbena, Hirudo sulukii, Macrobdella decora, Haementeria officinalis, Hirudinaria manillensis, Hirudotroctina, Hirudo quinquestriata, Hirudo nipponia, Poecilobdella granulose and Hirudinaria javanica. The medicinal leech (H. medicinalis) was certified by Food and Drug Administration (FDA) on June 21 (1).
Medical leech therapy (MLT) is used today to provide revascularization after restitching of the ruptured tissue, especially in plastic surgery, but it is also used as a protective in many diseases. Application is a complementary and supplementary treatment. In recent years, medical leeches produced under sterile conditions have gained increasing concern in reconstructive surgery, pain management, and other medical fields. In the retrospective analysis of the studies in which medical leeches were used to hold flaps and grafts, the success rate was found to be over 80%. The reason for using medical leeches is that they release anticoagulants, vasodilators, thrombolytic, antiinflammatory, anesthetic, analgesic and bacteriostatic bioactive substances to the tissue they absorb their blood. These bioactive compounds prevent hypoxia by increasing tissue vascular permeability, provide lower blood pressure and microcirculation(2).
The research and review literature on MLT has been evaluated in a scientometric study using many databases. A total of 834 articles were found of which 89.8% were original articles. USA was the leading country with 280 publications, followed by the UK, Germany, France, China, Russia, Canada, Turkey, India, and Italy (n=128, 101, 41, 38, 35, 34, 31, 30 and 28 items, respectively). The most productive countries regarding hirudotherapy were the UK (1.93), Slovenia (1.44), and Israel (1.32) (3).
Turkey was mentioned in 34 documents leech therapy in years between 1997-2019 and 11 of these studies report adverse reactions. The majority of these documents are associated with long-term bleeding. Others are caused by allergic reactions and infection.

Modes of action	Substance
Analgesic and antiinflammatory effect	Antistasin,hirustasin, ghilantens,eglin C, LDTI, complement C1 inhibitör, guamerin and piguamerin, carboxypeptidase inhibitor, bdellins and bdellastasin,
Extracellular matrix degradation	Hyaluronidase and collagenase
Increasing blood flow	Acetylcholine,histamine-like molecules
Inhibition of platelet	Saratin, calin, apyrase, decorsin
Anticoagulant effect	Hirudin, gelin, factor Xa inhibitor, destabilase, new leech protein-1, whitide, and whitmanin
Antimicrobial effect	Destabilase, chloromycetyn, theromacin, theromyzin, and peptide B

Table1. Some bioactive substances whose effects on leech secretion(4)

There are reported many adverse effects and complications associated with MLT; infection and allergy are the most common. Allergy is related to leech type and bioactive components that vary in secretion.

Also, local infections due to leech flora may be seen in non-medicinal leeches. Aeromonas bacteria are the most reported serious source of infection. The severity of infection varies depending on the type of leech, the application area and the condition of the patient. The risk of Aeromonas infection is high in immunosuppressed patients. Orthostatic hypotension and vasovagal symptoms may be seen especially in elderly patients. Medical leeches may cause long-term bleeding at the bite site, as well as ecchymosis and various skin lesions, regional lymphadenopathy. A patient who developed thrombotic microangiopathy and acute renal failure after MLT has also been reported(4-6).

There are some disorders that are absolute contraindications to medical leech therapy such as blood clotting disorder (e.g. hemophilia), severe anemia, arterial insufficiency, hematological malignancies, hypotension, septic disorders, known allergic reaction to active ingredients of the leech saliva (hirudin, hyaluronidase, destabilase, etc.), and patient refusal to leech therapy. Pregnancy and lactation are contraindication due to the risk of infection and bleeding(5). Patients on anticoagulants and immunosuppressive therapy should not be treated with leeches. Anticoagulants will increase the risk of major bleeding. Immunosuppression increases the risk of infections. Since erythrocyte transfusions may be necessary during medical leech therapy, patients who refuse transfusions should not be treated by leeches (1,7)

Conclusion: Studies on the use of MLT in traditional and complementary therapy are increasing. It is also used in many diseases with its therapeutic effects as support in preventive medicine. However, in this process, it is important to do more extensive research on bioactive substances in leech secretion due to the risk of acute and delayed infection, allergic reactions and other adverse effects with Aeromonas hydrophila. The number of leeches administered, the region and size being treated, the duration of treatment, individual characteristics require co-evaluation to reduce adverse reactions occurring.

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OFP8-Spectrophotometric Determination of Aluminium with Ortho Hydroxy Schiff Base in Drug

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Abstract: In this study, a Schiff base called (E)-2-((2- hydroxy -3- methoxy benzylidene)amino)-5-methylphenol (1S4) was used as a ligand. Spectrophotometric properties of the ligand has been determined and the optimum conditions for determining aluminium by complex formation with the ligand have been determined by UV-Vis. spectrophotometry. Under optimum conditions, the determination of aluminium in Kompensan® drug was done successfully. The LOD and LOQ values of the developed method were 0.01139 μg mL^{-1} and 0.0345 μg mL^{-1} for 1S4.

Keywords: Aluminium, Schiff base, Ultraviolet visible spectrophotometry, Kompensan®.

Introduction: Aluminium is used in a many areas, so it can enter the living body through inhalation, contact and nutrition. Searches have shown that aluminum has toxic effects in humans. Certain diseases are thought to be associated with high aluminium content in human tissues. Although there are many ways of exposure to aluminum, nutrition is seen as the main source of intaking aluminum. It is estimated that 20% of the aluminum taken into the body in one day comes from cooking and preserving containers. Certain antacid drugs used for stomach disorders contain significant amounts of Aluminium compounds. For these reasons, it is important to determine Aluminium [1, 2]. AAS [3-5], Chromatography [6, 7], Fluorescence [8], X-ray fluorescence spectrometry [9], Voltametry [10], Polarography [11], and ICP-MS [12, 13] methods are used for the determination of aluminium apart from UV-Vis. method. Although these methods give positive results for the qualitative and quantitative analysis, they need an expert and extra pre-treatment. UV-visible method has been the choice for this study because of less cost and ease-of-use in comparison to the other methods. Certain reagents used for the determination of aluminum in the last decade are summarized on the Table 1.

Table 1. Certain reagents used for the determination of aluminium in the last decade

Reagent	pH	λ, nm	ε, L/mol.cm	Linear Range, μg/mL	LOD μg/L	Ref.
Tetrahydroxyazon 2S	5	500	7.7×10^4	0.05-1.6	-	14
2-hydroxynaphaldehydebenzoil hydrazon	-	-	2.21×10^4	0.01-2.0	1	15
5-Bromo-2-hydroxy-3- methoxy benzaldehyde-p-hydroxy benzoichydrazon	3.0-7.0	-	2.66×10^4	0.053-0.755	-	16
Eriochrome Cyanine R	-	537	-	-	0.324	17
Chrome azurol S	-	620	-	-	0.0216	18
Quercetin	-	-	-	-	2	19

Schiff bases have attracted much attention of researchers due to their certain properties such as nonlinear optical properties, polymerization, metal bond formation abilities and superior biological activities [20, 21]. Schiff bases derived from aromatic o-hydroxyaldehydes have received attention due to their biological properties including antifungal, antibacterial, antimalarial, antiproliferative, anti-inflammatory, antiviral, antipyretic, herbicide properties and anti-tumor activity [20-24]. The purpose of the study is to develop a new method to determine

aluminium. To the best of our knowledge, (E)-2-((2- hydroxy -3- methoxy benzylidene)amino)-5- methylphenol (1S4) has not been used for the determination of aluminium (Fig. 1).

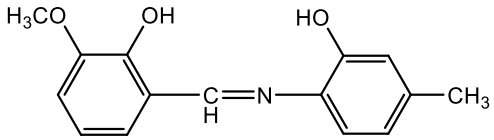

Fig 1. Chemical structure of (E)-2-((2- hydroxy -3- methoxy benzylidene)amino)-5- methylphenol (1S4).

Materials and Method: All the employed reagents were analytical grade and the solutions were prepared with bi-distilled deinoized water. aluminium solutions (ICP 1000 mg L^{-1}, Merck) as a stock solution was used. IS4 was prepared by dissolving 0.2032 g 1S4 in 500 mL of deionized water [25].The solution is stable for a one month at ambient temperature. The Al (III)-(E)-2-((2-hydroxy -3- methoxy benzylidene)amino)-5- methylphenol complex has been formed in optimum conditions detailed in 'Results and discussion' section. Transfer 1.4-13.5 µg Al (III) solution into a 25 mL calibrated flask. Add 1 mL $1.0x10^{-3}$ M 1S4 ligand and dilute to the mark with pH 5 buffer solution. Measure the absorbance at 413.5 nm against the reagent blank. The absorption of complex is affected by ligand concentration. Therefore, the concentration of ligand should always be identical in blank and tests solutions to be avoided possible absorbance errors. The 1S4 ligand solution, whose concentration and pH were the same with those of the complex, has been used as a blank. A calibration curve is obtained and the unknown amount of Al (III) is determined with similar method.

Results and Discussion: Absorbance values of the Aluminium complex with the ligand at different pH and the spectra are given in Figure 2 and the Table 2. The complex shows maximum absorbance at pH 9. Since Aluminium can precipitate or forms hydroxyl complex in alkaline medium, pH 5 was selected as an optimum pH. The data concerning complex formation depending on the time and temperature was given in the slight. The complex is stable up to 40 min. All the studies were done at room temperature. Optimum ligand concentration was at $1.5x10^{-4}$ M of 1S4. The stoichiometry of the complex was determined as (M:L) is 1:2 by Job method (Figure 3).

Table 2. Absorbance values of the Aluminium complex of 1S4 ligand at different pH (the standard for comparison: ligand)

	pH											
	1	2	3	4	5	6	7	8	9	10	11	12
Abs	0.619	0.796	0.730	0.745	0.824	-	-	-	0.887	0.705	0.700	0.425

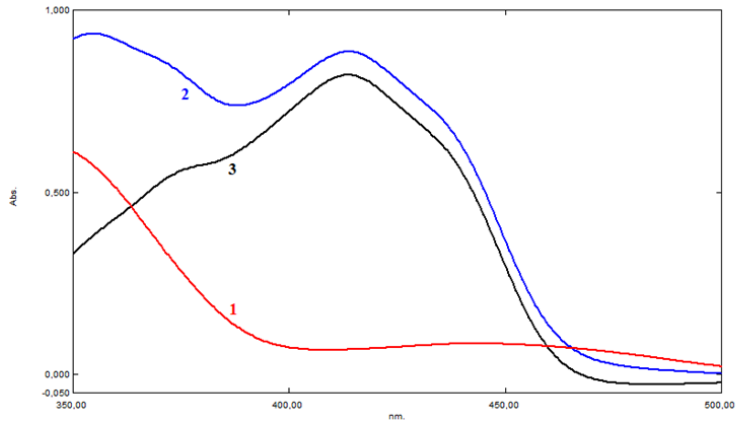

Figure 2. Absorption spectra, pH=5; (1) 1S4 ligand (comparison standard: water), C_{1S4}=2.0x10^{-4} M; (2) Al-1S4 complex (comparison standard: water), C_{Al}=5.0x10^{-5} M, C_{1S4}=2.0x10^{-4} M; (3) Al-1S4 complex (comparison standard:ligand), C_{Al}=5.0x10^{-5} M, C_{1S4}=2.0x10^{-4} M, l=1cm.

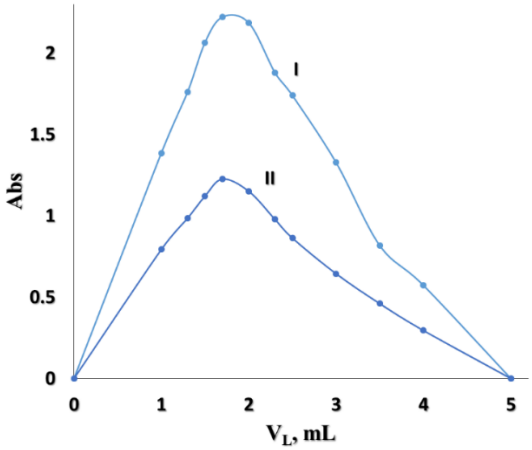

Figure 3. Determination of Al-1S4 Complex formation stoichiometry by Job method, 413.50 nm, comparison standard: ligand, l=1 cm, pH=5; (I) C_L=C_{Al}=1.0x10^{-3} M, (II) C_L=C_{Al}=5.0x10^{-4} M

The effect of interfering species was investigated, certain interfering species were masked. Under optimum conditions, the complex complies with Lambert-Beer law in the range of 1.4-13.5 µg ml^{-1} of Al. Artificial mixture including Al, Mg and Cr was prepared by done. The values of standard deviation, absolute and relative errors were acceptable levels (Table 3). The developed method was applied to the 'Kompensan®' drug. The developed method has high accuracy. There is no meaningful difference (Table 4).

Table 3. Determination of Aluminium in Artificial Mixture ((0.54 mg Al^{3+}+0.30 mg Mg^{2+}+0.13 mg Cr^{3+}) /100 mL) (n=5).

Taken, sample (A),mL	Amount of Al^{3+}, µg 10 mL^{-1}	Added standard Al^{3+}, µg 10 mL^{-1}	Found, Al^{3+}, x̄, µg 10 mL^{-1}	Standard deviation, s	Relative Error, % (RE%)	Absolute Error, Ix̄- x_{true}I
1.0	5.400	-	5.540	0.151	2.593	0.140
1.0	5.400	2.700	8.230	0.059	1.605	0.130
1.5	8.100	-	8.020	0.192	0.865	0.070
1.5	8.100	2.700	10.750	0.270	0.370	0.040

Table4. Determination of Aluminium in Drug Suspension (Kompensan®)

Certified value, Al, μ, mg	Found Al, $\bar{X}$, (CL)	Standard deviation, s	Relative standard deviation (RSD%)	Relative Error, %, (RE%)	$\lvert\bar{X}-\mu\rvert$	ts/√N
62.800	62.750± 0.067	0.054	0.089	0.080	0.050	0.067

Conclusion: A new UV–Vis. spectrophotometry has been developed to determine aluminium. In the range of 1.4-13.5 μg ml^{-1} Al(III), the method obeys Beer's law. Molar extinction coefficient of the Al(III)-1S4 complex (M:L;1:2) is 1.474×10^4 L mol^{-1} cm^{-1}. The developed method has high selectivity and sensitivity. It does not require any separation technique in this study. It does not need any surfactant to enhance the selectivity and sensitivity of the method. As a conclusion, the proposed method is simple, reproducible, easy and sensitive to determine aluminium. Moreover, the method can be successfully applied on artificial mixture and drug suspension to determine aluminium.

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OFP9-Temporal changes in gross α and β activity concentrations in a well located in the Uluova aquifer (Elazığ, Turkey): A health risk assessment

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Abstract: High levels of radioactivity in drinking water is a concern for human health. The aim of this study was to determine the changes in the long-term gross alpha and beta activity in a well located in the Uluova area in Elazig-Turkey and to evaluate human health effects. For this purpose, groundwater samples were collected during the wet and dry periods between 2009 and 2014 and analyzed for their gross α and β activities. The possible health risks of high radioactivity were estimated using WHO annual effective dose equivalent (DRw) model for the adult, children and infants. The levels of gross α and β activities in groundwater vary from 6 to 163 mBq/L and from 10 to 300 mBq/L, respectively. These ranges are within the limits given by WHO for drinking water. The results indicated that the annual effective doses for the three age groups are also lower than the limits recommended by WHO.

Keywords: Radioactivity, drinking water, gross alpha, gross beta, Uluova

Introduction: High levels of radioactivity in drinking water is a concern for human health. The biggest concern about the ionizing radiation (alpha and beta radioactivity) in groundwater is that it can cause cancer and genetic effects in people exposed to this kind of radiation. Possibility of inherited effects depends on the dose or amount of radiation received by the individual[1]. The occurrence of radioactivity in drinking water can arise from natural or anthropogenic sources. Radioactivity concentrations of groundwater are mainly due to radionuclides in soil and rocks present in the aquifer system[2]. Radionuclides found in groundwater are caused by thorium and uranium decay series elements. The radionuclides in the groundwater are mainly derived from thorium-226, radium-228, polonium-210, lead-210 and radon[3]. Magmatic and metamorphic rocks, together with sediments containing organic matter, clays, shales, sandstones and carbonates may naturally contain significant amounts of uranium, thorium, radium and radon. The different half-lives of radioactive elements (e.g., uranium, thorium, radium, and radon) and their high analysis costs make it difficult to determine the radioactivity values in groundwater. Because of these difficulties, in groundwater samples, total alpha and beta radioactivity is determined first and then the element causing this radioactivity is investigated depending on the results obtained. Drinking water radioactivity limits recommended by the World Health Organization (WHO) are 500 mBq/L for total alpha and 1000 mBq/L for total beta[4]. If these maximum permissible concentrations are exceeded, the radionuclides causing the activity must be investigated further. The dosage amounts determined for these radionuclides are compared with the effective dose (100 mSv/year) that can be taken after one year of use[4]. Despite negative effects of natural radioactivity in groundwater, it is commonly used for drinking and balneological purposes. For instance, recent studies involving bathing and drinking water cures have shown successful results in the treatment of metabolic diseases such as diabetes and obesity, bronchial asthma, allergy, and psoriasis[5]. The aim of this study was to determine the changes in long-term alpha and beta radioactivity in a groundwater well drilled in the Uluova region and to evaluate the alpha and beta activities in terms of human health.

Materials and methods: This research was carried out in a groundwater well located in the central part of Uluova Basin (Elazığ, Turkey) with UTM coordinates of 522325 E and 4272975 N (Fig. 1). The structurally controlled Uluova Basin hosts Permo-Triassic metamorphic rocks, Upper Cretaceous magmatic rocks, and Cenozoic volcanic and/or sedimentary rocks (Fig. 1) formed in a variety of geologic settings[6]. The area is characterized by a semiarid continental climate, with a long-term (1950-2015) average annual precipitation of 410.2 mm. Monthly precipitation in the area has a high inter-seasonal variability (42.1% in spring, 3.8% in summer, 23.3% in fall, and 30.8% in winter) and monthly average temperatures range from -0.9 °C to 1.6 °C in winter and 22.9 °C to 27.3 °C in summer[7].

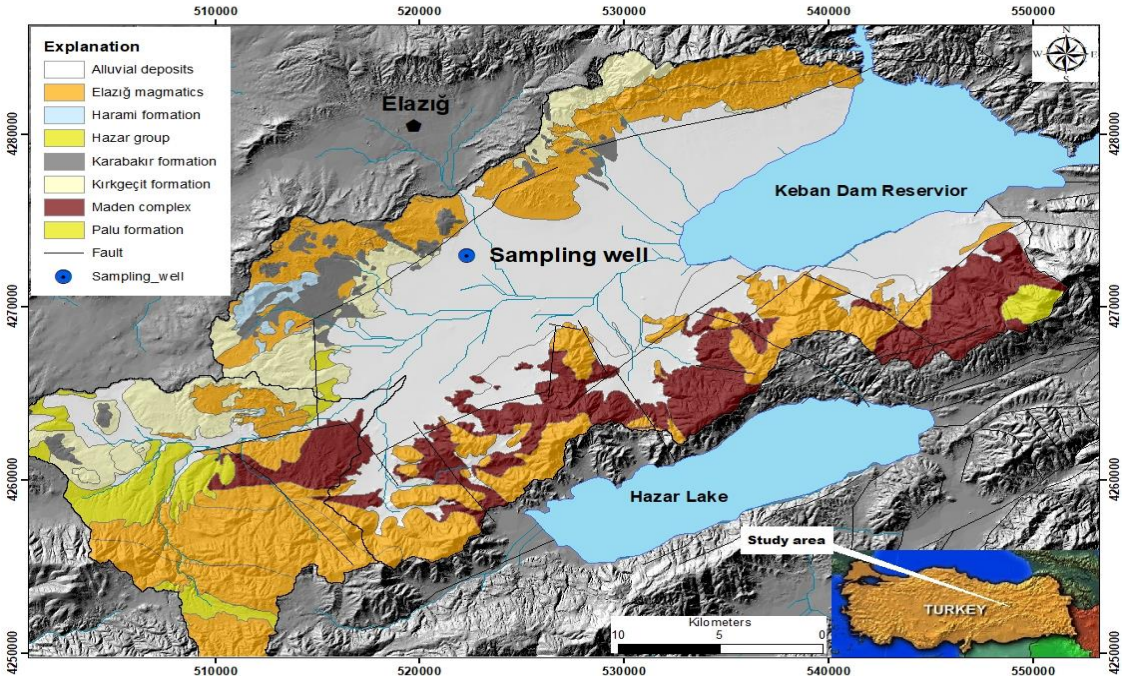

Figure 1. Geological map of the study area and well location[6].

In this study, groundwater samples from the well were collected twice a year between 2009 and 2014, during wet and dry periods. The groundwater sample was collected in a plastic container (with a capacity of 2,500 mL) and acidified in-situ with HNO_3 to pH 2.

The analyses of all water samples were performed at the General Directorate of State Hydraulic Works (DSİ), Department of Isotope and Water Analysis Laboratory. Total alpha and beta radioactivity concentrations in the water samples were determined by counting the evaporated samples in the total alpha and total beta counting system (Berthold Lb770-Pc 10-Channel Low Level Counting System) using the EPA 900.00 method. According to the results obtained from the gross alpha and beta concentration measurements, a risk assessment was performed. For this purpose, the annual effective dose is calculated using the Eq. (1)[8,9].

$$DR_W = A_W \times IR_W \times ID_F \quad (1)$$

where DR_W is the annual effective dose (AED) equivalent (μSv/year), A_W is the concentration of gross alpha and beta activity (mBq/L), IR_W is the intake of drinking water for a person in one year. The AED equivalents are estimated for infants (age < 1 year), children (age < 17 years) and adults (age > 17 years) who drink water of 250, 350 and 730 L per year, respectively[10]. The total indicative dose (TID) is estimated for all age groups using the approach presented in Table 1. ID_F is the annual effective dose conversion factors (mSv/Bq)[11]. The gross alpha activity is considered to be gained from ^{238}U, ^{234}U, ^{230}Th, ^{226}Ra, ^{210}Po and ^{232}Th isotopes. The gross beta activity is considered to be gained from ^{210}Pb and ^{228}Ra isotopes[10,12].

Table 1. The dose conversion factors suggested by the WHO (in mSv/Bq).

Emitters	Dose Conversion Factors
^{238}U	4.5×10^{-5}
^{234}U	4.9×10^{-5}
^{230}Th	2.1×10^{-4}
^{226}Ra	2.8×10^{-4}
^{210}Po	1.2×10^{-3}
^{232}Th	2.3×10^{-4}
^{210}Pb	6.9×10^{-4}
^{228}Ra	6.9×10^{-4}

Results and Discussion: The results of gross alpha and beta activities for the water samples taken from the drilled well are presented Figure 2. During the present study, the values of gross alpha and beta activities ranged between 6 to 163 mBq/L and 10 to 300 mBq/L, respectively. The minimum values were observed during the dry and wet periods of 2014 for the gross alpha and gross beta activities, respectively. Maximum value for gross alpha activity was measured during the dry period of 2012, whereas for gross beta activity it was measured during the wet period of 2010 (Fig. 2). The gross α and gross β activities have average values of 93 mBq/L and 73 mBq/L for the drilled well. The measured gross α and β activity average concentrations are below the permissible limits given by the WHO for drinking water (500 mBq/L for alpha activity and 1000 mBq/L for beta activity).

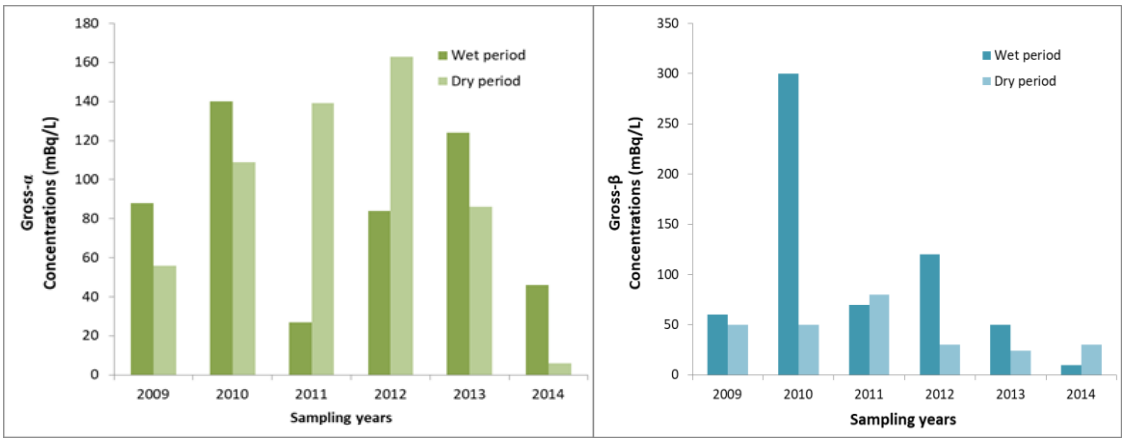

Figure 2. The gross alpha and beta activity concentrations.

The calculated annual effective dose equivalents for alpha and beta emitters are given in Table 2. The results for long-term averages reveal that the groundwater samples taken from the drilled well during study period are below the effective dose limit of 100 μSv/year recommended by WHO for drinking water.

Table 2. Estimated annual effective doses of gross- α and gross-β emitters.

Ages	Year	Period	^{238}U	^{234}U	^{230}Th	^{226}Ra	^{210}Po	^{232}Th	^{210}Pb	^{228}Ra
Adult	2009	Wet	2.89	3.15	13.49	17.99	77.09	14.78	30.22	30.22
		Dry	1.84	2.00	8.58	11.45	49.06	9.40	25.19	25.19
	2010	Wet	4.60	5.01	21.46	28.62	122.64	23.51	151.11	151.11
		Dry	3.58	3.90	16.71	22.28	95.48	18.30	25.19	25.19
	2011	Wet	0.89	0.97	4.14	5.52	23.65	4.53	35.26	35.26
		Dry	4.57	4.97	21.31	28.41	121.76	23.34	40.30	40.30
	2012	Wet	2.76	3.00	12.88	17.17	73.58	14.10	60.44	60.44
		Dry	5.35	5.83	24.99	33.32	142.79	27.37	15.11	15.11
	2013	Wet	4.07	4.44	19.01	25.35	108.62	20.82	25.19	25.19
		Dry	2.83	3.08	13.18	17.58	75.34	14.44	12.09	12.09
	2014	Wet	1.51	1.65	7.05	9.40	40.30	7.72	5.04	5.04
		Dry	0.20	0.21	0.92	1.23	5.26	1.01	15.11	15.11
Children	2009	Wet	1.39	1.51	6.47	8.62	36.96	7.08	14.49	14.49
		Dry	0.88	0.96	4.12	5.49	23.52	4.51	12.08	12.08
	2010	Wet	2.21	2.40	10.29	13.72	58.80	11.27	72.45	72.45
		Dry	1.72	1.87	8.01	10.68	45.78	8.77	12.08	12.08
	2011	Wet	0.43	0.46	1.98	2.65	11.34	2.17	16.91	16.91
		Dry	2.19	2.38	10.22	13.62	58.38	11.19	19.32	19.32
	2012	Wet	1.32	1.44	6.17	8.23	35.28	6.76	28.98	28.98
		Dry	2.57	2.80	11.98	15.97	68.46	13.12	7.25	7.25
	2013	Wet	1.95	2.13	9.11	12.15	52.08	9.98	12.08	12.08
		Dry	1.35	1.47	6.32	8.43	36.12	6.92	5.80	5.80

	2014	Wet	0.72	0.79	3.38	4.51	19.32	3.70	2.42	2.42
		Dry	0.09	0.10	0.44	0.59	2.52	0.48	7.25	7.25
Infant	2009	Wet	0.99	1.08	4.62	6.16	26.40	5.06	10.35	10.35
		Dry	0.63	0.69	2.94	3.92	16.80	3.22	8.63	8.63
	2010	Wet	1.58	1.72	7.35	9.80	42.00	8.05	51.75	51.75
		Dry	1.23	1.34	5.72	7.63	32.70	6.27	8.63	8.63
	2011	Wet	0.30	0.33	1.42	1.89	8.10	1.55	12.08	12.08
		Dry	1.56	1.70	7.30	9.73	41.70	7.99	13.80	13.80
	2012	Wet	0.95	1.03	4.41	5.88	25.20	4.83	20.70	20.70
		Dry	1.83	2.00	8.56	11.41	48.90	9.37	5.18	5.18
	2013	Wet	1.40	1.52	6.51	8.68	37.20	7.13	8.63	8.63
		Dry	0.97	1.05	4.52	6.02	25.80	4.95	4.14	4.14
	2014	Wet	0.52	0.56	2.42	3.22	13.80	2.65	1.73	1.73
		Dry	0.07	0.07	0.32	0.42	1.80	0.35	5.18	5.18
Adult	Long-term average		3.06	3.33	14.26	19.01	81.47	15.61	36.77	36.77
Children			1.46	1.59	6.84	9.11	39.06	7.49	17.63	17.63
Infant			1.05	1.14	4.88	6.51	27.90	5.35	12.59	10.35

Conclusions: The gross-α and gross-β activities in groundwater samples taken from a drilled well located in the Uluova Basin (Elazığ) were found lower than the WHO recommended limits. Estimated annual effective dose values of groundwater for the three age groups indicate values below the WHO permissible limit, except doses caused by ^{210}Po, ^{210}Pb and ^{228}Ra in some sampling periods. Seasonally, periodic differences were observed in gross-α and gross-β activities of groundwater samples. Basin wide monitoring programs should be developed to identify both temporal and spatial changes occurring in alpha and beta activity of groundwater samples. If the annual average values exceed the limit values, water should be filtered through appropriate filters or mixed with radionuclide-free waters to reduce the radioactive concentrations.

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OFP10- Development and Application of Advanced Absorbance Subtraction Spectrophotometric Method for the Quantification of the Antiretroviral Compounds in Medical Dosage Forms

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The aim of this work is to develop and application an advanced absorbance subtraction and advanced amplitude modulation spectrophotometric methods for the quantification of Lamivudine (LAM) and Zidovudine (ZID) in medicinal dosage forms. LAM and ZID belong to a class of drugs known as nucleoside reverse transcriptase inhibitors(1). LAM and ZID are co-formulated for the treatment of HIV, the virus that can cause acquired immunodeficiency syndrome (AIDS). Firstly, advanced absorbance subtraction method (2), the zero order absorption spectra of LAM and ZID in methanol were freshly prepared and recorded over the range 200-350 nm against methanol as blank. Two wavelengths are selected isosbestic point (256.8 nm) and 215.0 nm. The linear regression of absorbance signals on concentration gave the equation; y = 0.0319 x – 0.002 (R^2: 0.9999) (where y is analytical signals in the zero order spectra, and C is the concentration) at λ_{iso}, 256.8 nm. Lambert-Beer law is obeyed in the concentration range of 3.0–21.0 µg.ml^{-1} for LAM and 5.0–30.0 µg.ml^{-1} for ZID, respectively. In the secondly proposed method, advanced amplitude modulation spectrophotometric method ,the zero order absorption spectra of LAM were divided by the normalized ZID divisor, and amplitudes at 256.8 nm were recorded for the obtained ratio spectra. A regression equation was computed representing the linear relationship between the difference of ratio amplitudes of different concentrations at 260.5 nm and 215.0 nm. The methods were applied for the determination LAM and ZID in pure and medicinal dosage forms and the mean percentage recoveries are studied. The accuracy methods were also approved by recoveries study from medicinal dosage forms at the different levels of standard addition. Different concentrations of each of LAM and ZID were analyzed three times intra-daily and inter-daily on five days using advanced absorbance subtraction and advanced amplitude modulation spectrophotometric methods. Results were compared statistically to those of official and reported methods revealing no remarkable difference.

Keywords: *Lamivudine, zidovudine, advanced amplitude modulation, advanced absorbance subtraction, antiretroviral*

Introduction:

Lamivudine and zidovidune belong to a class of drugs known as nucleoside reverse transcriptase inhibitors. LAM and ZID (Figs. 1 and 2) are co-formulated for the treatment of HIV, the virus that can cause acquired immunodeficiency syndrome (AIDS). Lamivudine is a reverse transcriptase inhibitor. It has been shown to inhibit type I and type II reverse transcriptase enzyme.

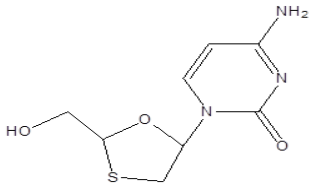

Figure 1. Chemical structure of Lam

Zidovudine is used orally. It is rapidly absorbed from the gastrointestinal system.Lamivudine has been shown to interact as an additive or synergist with other anti-HIV drugs, particularly zidovudine, in inhibiting HIV replication in cell culture.

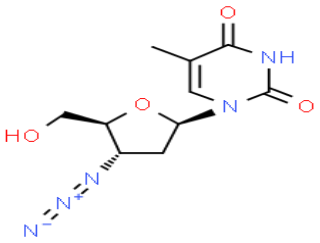

Figure 2. Chemical structure of Zid

In the aim of this work was to develop and application an advanced absorbance subtraction spectrophotometric method for the quantification of Lamivudine (LAM) and Zidovudine (ZID) in medicinal dosage forms

Materials:

Lam and Zid were obtained by Pfizer Pharm. Ind. as a gift and were used as received. Analytical grade methanol was purchased from Merck Chem.Ind. Stock solutions (0.2 $mgmL^{-1}$) of Lam and Zid were in methanol and were further diluted with the same solvent as appropriate. Stored at +50 ºC in the dark, these solutions were shown to be stable during the period of study. The spectrum was obtained using a Shimadzu 1800 double beam UV-Vis spectrophotometer with a fixed slit width (2 nm) connected to an PC computer loaded with Shimadzu UVProbe software.

Results and Discussion:

The absorption spectra of Zid, and Lam were overlapped closely as shown in Fig. 3. For this reason, the determination of the above compounds was not possible by direct measurements of absorbance in zero-order spectra.

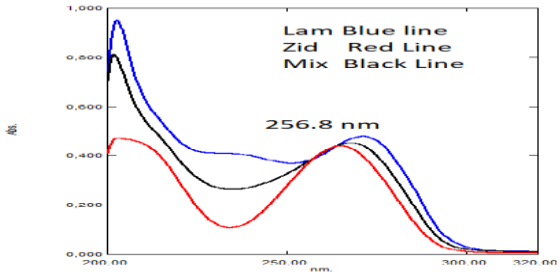

Figure 3. Zero-order absorption spectra of (red line) Zid (blue line) , Lam and (black line)mixture of Zid with Lam in methanol solution **(**$\Delta\lambda$ = 2nm)

The absorbance of scanned spectra of working range Lam was measured at 215.0 nm and 256.6 nm. Calibration graph was constructed relating the absorbance of the zero order spectra of Lam at isoabsorptive point 256.6 nm versus the corresponding concentrations of Lam and the unified regression equation was formulated. In order to access the validity and applicability of the described method, recovery studies were performed by analyzing synthetic laboratory mixtures of each drug in different ratios.The devoloped methods were applied to the simultaneous determination of **Lam** and **Zid** in pharmaceutical formulations, respectively. The results

presented in good agreement with the labelled content. All data represent the average of five determinations.

Conclusion:

The proposed novel methods were simple, very sensitive, precise, did not need a special program and could be easily applied in quality control laboratories as they were having equal accuracy and precision compared to the official or reported methods for the simultaneous determination of Lam and Zid in their pure bulk powders.

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OFP11-The Application of Vibrational Spectroscopy on Food Authentication

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Abstract-The awareness on food authentication is expanding every day because of the increasing public consciousness on food quality and security. Food adulteration and food fraud is a major worldwide public concern and a leading cause of trade problems internationally that has a cost to the global economy $15 billion per year. Likewise, to its economic effect, public health is also under risk and it could have much more consequences to the related food industry or food company. Food fraud has been conducted since ancient times olive oil and wine were the earliest counterfeit foods followed by fruit juices, spices, tea, milk, honey, and saffron. Current analytical methods to authenticate food products and to determine their quality rely mainly on chromatographic, elemental, and isotopic methods, which are time-consuming, costly, requires exhaustive workforce, and complicated sample preparation steps and skilled personnel. To prevent food fraud, analytical techniques should be fast, simple, reliable, cost effective, and need minimum sample preparation. Vibrational spectroscopy provides an alternative to traditional techniques to characterize and authenticate food and food products and this review presents state-of-the-art practices that can be used for the authentication of food and food products and associated developments in research with the focus on current advances in the food authentication.

Introduction

Thanks to the economic globalization and expanding worldwide food industry, consumers have access to an exceptional variety of food products [1]. On the other hand, food fraud is a worldwide public concern and has been conducted since ancient times [2]. Food forgers target expensive products and brands with powerful names that potentially causes ingredient tempering. Food fraud involves adulteration, falsification, substitution, dilution, tampering, mislabeling, contaminations, over-runs, counterfeiting, unapproved enhancements, and the deliberate labeling of incorrect products [3]. The main purpose of the food fraud is economic gain by enhancing the perceived quality of the product such as adding colorants to improve the color, or decreasing the product cost by substituting with cheaper ingredients, or increasing the shelf life by adding banned chemicals [4]. Food fraud has a cost to the global economy approximately $49 billion per year [5]. The incidents of food fraud can take place at any point of the food supply chain [6,7]. On the other hand, food authentication confirms that the food label is in agreement with its ingredients, source, production methodology, or processing technique [8]. In 2007, melamine addition to pet food cause kidney failure and deaths in cats and dogs in US [9]. Later than the pet food event, another melamine scandal burst in China, more than 294,000 kid suffered from kidney problems and more than 50,000 were treated in the hospital, and minimum of six of those kids were dead [10]. In 2013, Europe was shocked with the horsemeat scandal. At that time, foods that sold containing beef were found to contain undeclared or improperly declared horsemeat, which caused a financial crisis in Europe and also people started to lost their confidence to the brands [11]. This scandal caused huge economic problems and product recalls, and expensive authenticity testing, also affected ground beef sales in the United Kingdom and Europe [11]. Therefore, it is important to authenticate food products and verify their safety, and asses the quality of the food and food products. There is a huge need for precise and standardized authentication methodologies, which will serve the buyers, the shareholders that includes food businesses, and regulatory authorities [8]. This review presents state-of-the-art practices that used in authentication of food and food products and associated research advances that focused on current advances in the food authentication.

Analytical Techniques

1. Chromatographic techniques:

Chromatographic techniques are relying on the adsorption and/or partition of analytes among mobile and stationary phases. Chromatographic techniques consist of gas chromatography (GC)

and high pressure liquid chromatography (HPLC), both techniques provide relatively fast and reliable partition between analytes in complex food environments [8].

2. Isotopic techniques

Isotopic ratio utilizes different methodologies including isotope ratio mass spectrometry (IRMS), multi collector – inductively coupled plasma – mass spectrometry (MC-ICP-MS), and thermal ionization mass spectrometry (TIMS). Those techniques could be interfaced with various equipment such as; IRMS coupled along with elemental analyzer, pyroliser, equilibration tools, GC or HPLC, or heavy isotopes can be determined using MC-ICP-MS and TIMS. The ratio between 2H/1H can be analyzed by utilizing NMR with a deuterium probe.
Isotopic ratio analysis is suitable for food authentication due to the ratios of stable isotopes alters with location, climate, origin, soil pedology, and geology of the locations of food source [8].

3. Elemental techniques

Elemental profile in food implies, determination of macro-elements including sodium, calcium and potassium, trace elements including copper, zinc and selenium, rare earth elements including lanthanum, cerium and samarium, or other elements that is present a very low amount including iridium and gold. Foods can be authenticated by using elemental fingerprinting by using different analytical techniques and each of those methodologies have their own advantages and disadvantages. Some of those elemental fingerprinting methodologies are atomic absorption, inductively coupled plasma-mass spectroscopy (ICP-MS), inductively coupled plasma-atomic emission spectroscopy (ICP-AES) [8].

4. NMR

NMR analysis have been widely and efficiently used in food authentication. No need for a complex sample preparation steps is one of the most important advantage of the NMR analysis. NMR analysis can also detect various chemical species in one analysis. The main challenges of this technique are in order to get a good results or good spectra in terms of high quality and resolution, is the low sensitivity of NMR and its resonance assignment procedure [12].

5. Vibrational spectroscopy

All the techniques that have mentioned previously are successfully in use to detect the authenticity of food product. However, to be able to prevent food fraud and be able to authenticate food products there is a need for a technique, which is rapid, simple, reliable, cost effective, and need minimum sample preparation [13]. Vibrational spectroscopy techniques including near infrared (NIR), mid-infrared (mid-IR), and Raman can provide a good alternative to the aforementioned techniques such as chromatography, isotopic and elemental techniques, or NMR, in order to characterize and authenticate food and food products [14].
The vibrational spectroscopy equipment, which is mainly benchtop sized, has been the workhorses in numerous laboratories for the past few decades. On the other hand, these large benchtop spectrometers cost more than $100K and have delicate moving parts that needs to be aligned by trained technician in order to improve its optical accuracy for good measurements. The accuracy and consistency of the measurement that has been doing with the vibrational spectroscopic equipment has been improved over the years while their size continuously getting smaller as a result of the developments in electronics, photonics and chemometrics. These small spectrometers are being in used in wide range of practices by food industry for determining internal and external quality parameters of fruits and vegetables; the fat content of the meat, fish, and poultry; the oxidation stage and the fatty acid profile of the oils and fats; protein content of cereals and grains' the quality parameters of the beverages and dairy products; the ripeness stages of grapes, and; the authentication of food products. The on-site application of vibrational spectroscopy techniques has created new opportunities for rapid and direct in-field detection of important internal and external traits through the food supply chain, by defeating the requirements for complicated and specific sampling procedures [15].

Conclusion

In this review, different methodologies in order to determine food authentication and their advantages and disadvantages were discussed. Vibrational spectroscopy offers simple, non-destructive, rapid, simultaneous, and high throughput analysis on authentication and chemical profiling. Furthermore, bulky and expensive benchtop sized vibrational spectroscopy devices becomes filed deployable, cheaper and faster handheld and portable equipment, thanks to the developments in electronics, photonics and chemometrics analysis.

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OP12-Thymoquinone, a main component of Nigella Sativa, decrease of URG-4/URGCP gene expression in Pancreatic cancer cells

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Thymoquinone (TQ; 2-isopropyl-5-methyl-1,4 benzoquinone) is the predominant bioactive constituent present in the volatile oil of Nigella sativa, has antioxidant effects and has been shown to protect against heart, liver, and kidney damage in animal studies [1,2]. In addition, it inhibited cell proliferation of several cancer cell lines, including colon, ovarian, lung, and myeloblastic leukemias [3]. URG-4/URGCP that is identified as an oncogene in 2002, is over expressed in many cancer cell types [4]. In this study, URG-4/URGCP mRNA expression was determined in TQ-treated Panc-1 (Human Pancreatic Cancer Cell line) and Mia-PaCa-2 (Human Pancreatic Cancer Cell line) cell lines. qRT-PCR studies were performed with specific URG-4/URGCP primers using cDNA template. Human beta microglobulin primers were used for normalization. In a result of qPCR analyses, URG-4/URGCP expression was decreased in presence of TQ in two different pancreatic cancer cell line.

Keywords: Thymoquinone, URG-4/URGCP, Panc-1, Mia-PaCa-2

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OP13-Selective Seperation of Hemoglobin in Blood Serum Using Molecularly Imprinted Polymer-Based Affinity Traps

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Abstract: The current work demonstrates the design, characterization, and preparation of molecularly imprinted microspheres for the selective detection of hemoglobin in blood serum samples. The suspension polymerization approach was applied for the preparation of hemoglobin imprinted microspheres. For this purpose, N-methacryloylamino folic acid-Nd(III) (MAFol-Nd(III)) was chosen as the complex functional monomer. The optimization studies were performed changing the medium pH, temperature, and hemoglobin concentration. pH 7.0 was determined as the optimum value where the prepared imprinted microspheres displayed maximum binding for hemoglobin. The maximum binding capacity was achieved as 196 mgg^{-1}. In addition, the selectivity studies were conducted. The results confirmed that the imprinted microspheres showed great selectivity towards hemoglobin in the existence of myoglobin, cytochrome c, and lysozyme which were chosen as potentially competing proteins.

Keywords: *Hemoglobin, Folic Acid Monomer, Neodimyum (III), Molecularly Imprinted Polymer*

OP14-MicroRNA-associated candidate molecular pathways and key regulators in schizophrenia identified by using bioinformatic analyses

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Emerging evidence indicates the value of utilizing miRNA biomarkers in diagnosis, prevention and diagnosis of the Schizophrenia (SCZ), however their potential roles in the SCZ pathogenesis remain largely unknown/unexplored1. The aim of this study to identify putative functions of miRNAs in SCZ and assess their interactions with key regulators contributing to the SCZ-associated pathways by using bioinformatic tools.

Microarray data set (GSE54578) was downloaded from Gene Expression Omnibus. Differentially expressed miRNAs (DEMs) were analyzed in GEO2R using Limma R and the cut-off criteria for DEMs were set as an adjusted-p<0.05 and a fold change>1.5 or <-1.5. DIANA miRPath and DAVID databases were used for functional enrichments of the DEMs and their targets, respectively. Target genes of the miRNAs were analyzed by using Ingenuity Pathway Analysis and constructed protein-protein interaction was imported to Cytoscape for visualization and hub gene identification. Transcription factor (TF)-miRNA interactions were also assessed by Transmir and expressions of the possible hub genes were evaluated in SCZ patients and healthy individuals through schizophrenia database (SZDB).

A total of 18 DEMs were found in SCZ patients as compared to controls. Top Kyoto Encyclopedia of Genes Genomes (KEGG) category was related immune system (chemokine signaling pathway). Functional enrichment of significant DEMs revealed several significant pathways highlighting their roles in glycan metabolism, substance addiction and cancer. Seven hub genes were identified by Cytohubba and evaluating them in SZDB revealed AKT1 and PI3K were dysregulated in SCZ. TP53, one of the hub gene, was the top transcription factor that was predicted to be regulated by 10 miRNAs in TF-miRNA interaction analyses.

Our results highlight candidate molecular pathways and key regulators that may involve in the etiology and pathogenesis of SCZ of which can be utilized for novel translational strategies for prediction, prevention and management of SCZ.

Key words: *Schizophrenia, miRNA, biomarker, bioinformatic*

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OP15-Effects of Lactobacillus plantarum on hepatic insulin signaling and glucose transporters in high-fructose-fed rats

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The prevalence of non-alcoholic fatty liver disease is elevating in worldwide, this trend is largely attributed to excess fructose intake. Insulin resistance plays a critical role in the development of this hepatic disturbance. In recent decades, the beneficial effects of probiotics on diseases has been under extensive investigation. However, the influence of probiotic treatment on fructose-induced fatty liver remain poorly understood. Thus, we investigated the effect of Lactobacillus plantarum (L. plantarum) on hepatic insulin signalling of fructose-fed rats. Fructose was given to the rats as a 20% solution in drinking water for 15 weeks. L. plantarum supplementation was performed by gastric gavage once a day during six weeks. Dietary high fructose or probiotic supplementation did not change the body weights of rats. High fructose diet resulted in increased liver weight, plasma insulin, triglyceride, VLDL, which were alleviated after L. plantarum supplementation. Moreover, total caloric intake and plasma glucose increased in fructose-fed rats, but the probiotic supplementation did not cause a notable change. There was also no significant alteration in plasma total cholesterol, LDL and HDL. High fructose consumption in rats caused a decrease in the protein expression of IRS-1, pAkt/Akt and peNOS/eNOS ratios, but an up-regulation of glucose transporters GLUT2 and GLUT5 mRNAs in the liver. L. plantarum supplementation significantly improved this parameters, apart from GLUT5 expression. L. plantarum supplementation considerably restored hepatic changes induced by high fructose. This improvement may provide a novel molecular insight, as well as therapeutic approach, for the fatty liver induced by dietary high-fructose.

Keywords: Lactobacillus *plantarum;* high *fructose diet; liver; insulin signalling; glucose transporters*

OP16-Effects of Feeding Honeybee (Apis Mellifera L.) Colonies with Different Industrial Carbohydrate Sources on Royal Jelly and Honey's Sugar Composition

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Apitherapy centers, which are called apitherapy and using only bee products, are spreading rapidly. Some factors such as climate change, pesticides, diseases and pests affect honey bees negatively. When honey bees find it difficult to provide sufficient amounts of pollen and nectar, beekeepers feed their colonies with honey and pollen substitutes. For bees, this nutrition is usually made with industrial carbohydrate sources. Intensive feeding applications with industrial sugars and the type of sugar used in feeding are important in terms of the content of bee products. It is possible to store these industrial sugars in an inappropriate environment, not to detect their contents in accredited laboratories, to follow up most of the carbohydrate-containing feed products by the related institutions, to show different composition of their contents, to make economic troubles and to reduce the cost of production during the production process. Therefore, it is possible to incorporate products that are unsuitable for health into carbohydrate-derived feed products. In this study, it was aimed to determine the effects of honey bee (*Apis mellifera* L.) colonies on different sugar confectionery and royal jelly and honey composition. For this purpose, bee colonies are located in two different locations (1-Malatya Battalgazi/Ulukoy and 2- Malatya Doganshehir / Bugday Deresi) and in each of these locality groups; A total of 4 feeding groups were formed: sugar syrup, glucose syrup, pasteurized bee feed syrup and control group. 5 colonies were used in each of these feeding groups. Thus, there were 40 colonies in total, 20 in each location group.
Sugar levels in royal jelly and honey samples were determined by HPLC-RID system (Table 1). Water: Acetonitrile (20:80, v: v) was used as mobile phase.

Table 1: Some sugar levels in honey and royal jelly samples (%)

Examples →	**Royal Jelly**				**Honey**			
Carbohydrate sources ↓	**Glucose %**	**Fructose %**	**Sucrose %**	**Maltose %**	**Glucose %**	**Fructose %**	**Sucrose %**	**Maltose %**
Control	2.90	4.75	0.21	*	31.20	31.81	*	*
Bee Feed	3.82	5.01	0.64	*	33.24	33.26	*	*
Sucrose	3.49	5.44	0.74	*	30.23	34.36	*	*
Glucose Syrup	2.65	1.74	0.16	2.26	37.62	17.26	*	*

* Below the limit of assignment

When all the data were examined, it was observed that there were significant correlations between locations and feeding differences. ($p < 0.05$).

Keywords: *Honeybee (Apis mellifera L.), carbohydrate feeding, honey, royal jelly, HPLC-RID*

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OP17-Gender dependent effects of resveratrol and regular exercise on the expression of various proteins in kidney

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Resveratrol and regular aerobic exercise have protective effects on kidney in various pathological conditions. Although there is growing evidence suggesting that resveratrol and regular exercise have beneficial effects on renal pathologies, sex differentiation of the effects and detailed mechanisms of action have not been fully examined yet. In the current study, the gender-dependent effects of resveratrol and regular aerobic exercise on the expressions of some proteins involved in endoplasmic reticulum stress (ERS), inflammation, fibrosis and mitosis-associated pathways were investigated in the kidney of the male and female rats.

In this study, 3-month-old male and female Wistar albino rats were used. Resveratrol was given in the drinking water (approximately 7.5 mg/kg) for 6 weeks. In the exercise group, all rats were performed treadmill running at 20 m/min on a 0° incline, 40 min/day, 3 days per week, for 6 weeks. The rats in the control groups, tap water was given and exercise was not performed. At the end of the study, kidneys were isolated and protein expressions of various molecules were examined by Western Blot method.

Glucose-regulated protein (GRP78) expression was higher in the control male animals compared with the female animals. The phosphorylated-protein kinase RNA-like endoplasmic reticulum kinase (p-PERK) expression in male resveratrol and exercise groups were lower than in female animals. While resveratrol only increased p-PERK expression in females, exercise training did not affect GRP78 and p-PERK expression in both of gender. In females, the phospho-inhibitor κB-α (p-IκB-α) expression is greater and matrix metalloproteinase-2 (MMP-2) expression is smaller than males. The tumor necrosis factor-α (TNF-α) expression of female resveratrol group was higher than males. Resveratrol intake enhanced TNF-α and MMP-2 protein levels in female group. When compared to the male animals, p-akt level was high and p-erk level was low in female animals. Resveratrol decreased Akt and Erk protein expression in males and increased p-Erk expression in females. Exercise training only reduced Akt levels in male rats.

Our results demonstrated that renal protein expressions related to ERS, inflammation, fibrosis and mitosis were differentially affected by resveratrol intake and regular exercise training, in the gender-dependent manner.

Key Words: *Kidney, endoplasmic reticulum stress, inflammation, fibrosis, mitosis, gender.*

OP18-Evaluation of Immunoglobulin G glycosylation in Rheumatoid Arthritis as a biomarker for prognosis, diagnosis and response to treatment

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Introduction: Rheumatoid arthritis (RA) is an immunoglobulin G (IgG)-dependent autoimmune disease. IgG is a dimer of a dimer with two-heavy and two-light chain resulting in two functional domains: Fc and Fab. While Fab domain is important for antigen recognition, Fc-domain mediates effector function. At the Fc-domain, there is a conserved N-glycan with varying structures. This N-glycan is critical for the effector function of IgG and skews toward less processed proinflammatory agalactosylated glycan structures (GO) in RA. Using small cohorts of RA, it was shown that G0 normalized by monogalactosylated glycan structures (G0/G1) associates with RA and RA disease activity. To follow up these earlier observations in a larger cohort, G0/G1 ratio is evaluated as a potential biomarker for RA diagnosis, prognosis and response to treatment using well-defined human cohorts: the Brigham Rheumatoid Arthritis Sequential Study (BRASS), BRASS-Nested, and the Department of Defense Serum Repository (DoDSR) cohorts.
Methods: The galactosylation status of IgG specific N-glycans is extracted from whole serum N-glycan analysis using normal phase high-performance liquid chromatography. The ratio of G0/G1 was calculated in a cross-sectional cohort of BRASS for active RA and healthy controls, BRASS-Nested for MTX or anti-TNF biologics treatments and DoDSR before and after RA diagnosis. G0/G1 obtained from these cohort studies were correlated with clinical response as assessed by 28-joint Disease Activity Score utilizing C-reactive peptide (DAS28-CRP).
Results: Aberrant galactosylation of IgG is present in RA patients compared to healthy controls in all cohorts studied here. In a cross-sectional study with BRASS cohort, this aberrant galactosylation of IgG is present in RA patients as compared with healthy controls using G0/G1 ratio (mean ± SD 1.36 ± 0.43 vs 1.01 ± 0.23; $P < 0.0001$). In DoDSR cohort, this aberrancy can be measured 3.5 years before the diagnosis of RA. And, in BRASS-Nested cohort, this aberrancy decreases with the successful MTX and anti-tumor necrosis factor antibody treatments which is apparent with a reduction in DAS-28-CRP (Spearman's $\rho = 0.31$, $P = 0.04$).
Conclusions: The aberrancy of IgG galactosylation is reproducible in different cohorts by different research groups. In addition, it predates the disease activity and returns toward the values similar to the healthy controls with the successful treatment judged by the correlation between clinical improvement and aberrant galactosylation of IgG. However, aberrancy in IgG glycosylation is not enough to diagnose RA patients and distinguish RA patients who would likely to experience a favorable clinical response to MTX or TNF blockade with the current approach. İt requires further refinement to use IgG glycosylation as a biomarker for RA diagnosis, prognoses, and response to treatment.

OP19-In Vitro Controlled Release and Cytotoxicity Test of Nigella Sativa Oil Loaded Polyurethane Nanofiber Mat: As Using Potential Wound Dressing

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The seeds of Nigella sativa (NS), commonly known as "black seeds", is an herbal plant that grows around of Mediterranean countries. The NS seeds have variety application in the traditional medicine since the ancient times and have used for various diseases complaints including, headache, diabetes, cough, flatulence, antispasmodic. In recent researches have been demonstrated that Nigella sativa seeds oil and its chemical components have variety of pharmacological and therapeutic effects such as analgesic, anti-inflammatory effect, anti-cancer, antibacterial activity, anti-oxidant effect and wound healing properties[1].

Polymeric nanofibers have unique characteristic properties, such as ultra-fine fiber diameter, high surface area per unit mass, high porosity, small pore size, high mechanical properties, and extreme flexibility depending on the polymer structure. Thus, these properties are appropriate to wound dressing applications[2]. Electrospinning is a flexible and cost effective method for the production of ultrafine nanofiber with the usage of electrostatically forces. The basic principle of this method, polymer solution is deformed by electrical forces and a droplet is drawn from polymer solution that called Taylor cone. With the increasing voltage, the solvent evaporates, leaving behind a mat of dry polymeric nanofibers on the grounded collector. Polyurethane (PU) is a highly used polymer in medical applications, such as vascular grafts, tissue engineering applications, heart valve, drug delivery systems, wound healing applications[3-4].

The aim of this study is to investigate the potential usage of electrospun Nigella sativa oil loaded nanocomposite polyurethane nanofibrous mats as a wound dressing. Therefore, nanocomposite fibrous mats that is comprising of 10% (v/v) Nigella sativa oil were produced by one nozzle electrospinning method. The surface morphology and chemical properties of mats were characterized by scanning electron microscope (SEM), contact angle measurements and Fourier Transform Infrared (FTIR) spectroscopy. Afterwards, the application performance of the produced mats as wound dressings were investigated by in vitro assays. In terms of this, the amount of Nigella sativa oil released from polyurethane nanofiber was determined by UV-VIS. According to release data from polymeric nanofibers, Korsmeyer-Peppas mathematical model was found to be the most suitable kinetic model for oil release behavior from polymeric nanofibers. In in vitro cytotoxicity studies, cell viability index was determined by using WST analysis in HUVEC cell line of nanofibrous mats with and without Nigella sativa oil. It was determined that cell viability indexes were above 70% and cell proliferation occurred on the nanofibrous mat with the highest amount of black seed oil.

***Keywords**: nigella sativa oil, polyurethane, electrospinning, nanofiber mats, In vitro release, cytotoxicity*

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OP20-Carvone hydrazones as potential analgesic and anticonvulsant agents

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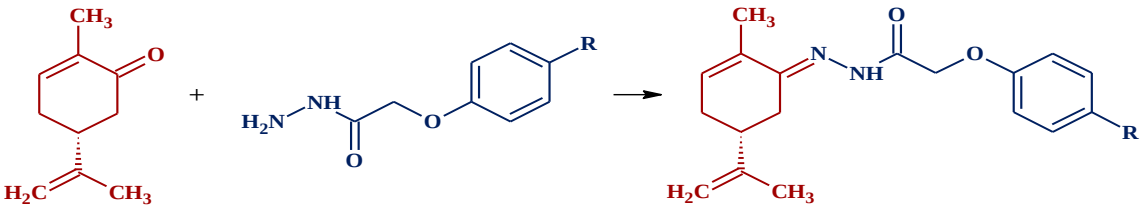
Modern drug design is developing along the path of creating targeted therapy which is selective and accurate. In this context, crucial is our understanding of pharmacological targets, binding sites of bioactive molecules and, accordingly, pharmacophore functional groups necessary to produce a given biological response. To date, significant progress had been made in identification and structure determination of novel targets for phytochemicals–transient receptor potential (TRP) channel involved in nociceptive transduction.

On the other hand, naturally occurring compounds such as terpenoids affect central nervous system by interaction with GABA receptors. The aforementioned effects might be enhanced by terpenoid combination with substituted phenoxyacetic acids that are also capable of exhibiting peripheral nociceptive action and possess anticonvulsant potentialities. To achieve this goal, a series of novel hydrazones containing residues of monocyclic terpenoid (–)-carvone and phenoxyacetic acid moieties have been synthesized and investigated as potential analgesic and anticonvulsant agents. The structure of (–)-carvone hydrazones was characterized by ^{13}C-NMR, ^{1}H-NMR, FTIR-ATR, Raman-spectroscopy, ESI-mass spectrometry along with two-dimensional (2D) nuclear Overhauser effect spectroscopy (NOESY) NMR. All compounds have been synthesized and purified up to 99% purity confirmed by high-performance liquid chromatography (HPLC); thermal behavior of carvone derivatives was performed by differential scanning calorimetry (DSC).



R = H, Cl, C(CH$_3$)$_3$, Br, O-C$_6$H$_5$

The influence of carvone hydrazones on the central and peripheral nervous system was reliably confirmed by evaluating their anticonvulsant and analgesic activity. The present findings indicate that all above-mentioned compounds possess antiseizure action throughout 24 h after oral administration on PTZ-induced and maximal electroshock seizure (MES) convulsion models. Analgesic effect of (–)-carvone hydrazones was elucidated after transdermal delivery via chemical-induced pain models. In this study, pain in experimental animals was caused by selective agonists of TRP channel – capsaicin and allyl isothiocyanate (AITC) via their subplantar injection. All the tested compounds were found to suppress painful sensation produced by noxious stimuli indicating TRP channels (specifically, TRPV1 and TRPA1) as molecular targets of carvone derivatives.

Thus, the current study reveals a strategy for drug development possessing simultaneously pain relief and antiseizure action. This idea is implemented by targeted synthesis of carvone low molecular weight derivatives – hydrazones as promising agents with dual effects.

***Keywords**: carvone, hydrazones, synthesis, analgesic action, anticonvulsant activity, TRP channels, GABA receptors*

OP21-A Novel Vortex Assisted Dispersive Solid Phase Extraction of Some Trace Elements in Essential Oils

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Alternative medicine applications attract more attention than academic medicine treatments, in recent years. This is not limited only as substitute, but in some cases as complementary approach. One representative of this tendency is the aromatherapy especially the use of essential oils for the treatment of problems regarding person's mind, body and soul. The essential oils are applied directly or in diluted form on the skin for treatment. Due to directly applications on skin, the components especially metals including nickel, chromium and lead may cause irritation.

The quantification of trace metals in essential oil samples particularly difficult due to very low concentration and high organic matrix. Considering the expensive requirements and disadvantages of the classical methods, a novel methodology was recommended for element determination for essential oil samples. In this study, a vortex assisted solid phase extraction procedure was suggested for simultaneous separation and preconcentration of chromium, nickel, copper, lead, manganese and cadmium. A novel alumina based modified sorbent was utilized. Confirmation of the sorbent modification was achieved using scanning electron microscope (SEM) and Fourier Transform infrared spectrometry (FT-IR). Inductively coupled plasma optic emission spectrometry (ICP-OES) was used for the determination of the interested elements. The operating conditions of the vortex assisted solid phase extraction were: sorbent amount 0.5 g, sample-sorbent contact time 40 s, applicable sample amount 20 mL, eluent 5 mL 0.3 M HCl solution and eluent-sorbent contact time 40 s. The accuracy and precision of the suggested procedure were tested with oil based multi element Conostan standard and the results were between 98.4(±3.3)-101.0(±3.7) % and 3.4-7.0 % respectively. Moreover, the proposed method was also applied to multi element spiked and unspiked essential oils including thyme, mint, apricot, pine turpentine, black cumin and fish oil samples. The obtained results were quantitative and satisfactory enough.

Keywords: *essential oil, trace element, solid phase extraction, ICP-OES*

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OP22-Aptamer-Based Electrochemical Nanobiosensor Applications for Early-Stage Cancer Diagnosis

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Aptamers are synthetic nucleic acid ligands (single-standed DNA or RNA) that capable of binding to target molecules not only with high specifity but also high affinity. The single-stranded nature of the aptamer changes into a three-dimentional structure in the presence of the target molecule. To date, various aptamers have been developed for the detection of wide range of molecules including proteins, peptides, whole cells, cell surface receptors, drugs and also small molecules like glucose, steroids and caffeine. Although aptamers recognize and bind targets of interest just like antibodies, they have a number of advantages, such as *in vitro* synthesis via process called "systematic evolution of ligands by exponential enrichment" (SELEX), shorter generation time, lower costs of manufacturing, no batch-to-batch variability, higher modifiability, better thermal stability and higher target potential ranging from ions to live animals [1].

Cancer is still one of the leading causes of human death and the global cancer burden is increasing gradually. In order to increase the survival rate of cancer patients, POC (point-of-care) devices such as biosensors are needed to be developed for early diagnosis of cancer [2]. In recent years, aptamer-based biosensors have been developed to detect either whole cancer cells or cancer related biomarkers. Specifically, with their ability to distinguish cancer cells from normal cells, aptamers allow a comparative strategy to identify differences at the molecular level and promote the discovery of molecular features of cancer cells [3]. Electrochemical biosensors are mostly preferable to other transducer-based (optical, piezoelectrical, calorimetric etc.) biosensors due to their low cost, ease of use, high sensitivity, rapid response and suitability for portable use. Moreover, the integration of the nanotechnology into POC devices led to new and improved applications for biosensor technologies. In such system, the electrode surfaces are modified with conductive polymers, nanomaterials and composite materials to increase the sensitivity of biosensors. Modification of the electrode surfaces with various carbon nanomaterials such as graphene or carbon nanotubes are often used because of their extraordinary physical, chemical, electrical, optical, mechanical and thermal properties. Electrochemical biosensors based on carbon nanomaterials exhibit advantages such as high surface-to-volume ratio, rapid electron transfer due to their conductivity, and modification with various functional groups, paving the way for the potential for rapid, precise and low-cost detection of cancer-related biomolecules [4].

***Keywords**: aptamers, electrochemical biosensors, early-stage cancer detection, nanomaterials*

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OP23-Impacts of Rare Earth Elements on Animal and Human Health

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Rare-earth elements (REE) are consist of seventeen elements: fifteen the lanthanides (La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy,Ho, Er, Tm, Yb, and Lu) plus two Sc and Y. Due to their specific properties, REE have been used in a number of industrial, medical and agricultural or zootechnical applications. Currently, they have become very critical to several modern technologies ranging from cell phones and televisions to LED light bulbs and wind turbines [1]. REE and their alloys are also used in many devices that people use every day such as computer memory, DVDs, rechargeable batteries, cell phones, catalytic converters, magnets, fluorescent lighting and much more. As a results, there has been an explosion in demand for rare earth elements, during the past twenty years (taking into consider the cell phones in use has risen to over 7 billion, today). Currently there are a few major applications of REE in medicine but many more of them are on the horizon [2]. For example, Gd has been used in a chelated form as a contrast agent in magnetic resonance imaging (MRI) measurements. However, new research finds direct evidence of gadolinium deposition in neuronal tissues which can be harmful to patients [3-4]. New medical applications for these elements are being found at an increasing rate and emerging advancements such as nanotechnology might be used to enhance their use in medicine in the future.
In this study, we will discuss the future prospects of health risks with appliances using REE and the significance of preventive efforts for human and animals health.

Keywords: *Rare earth elements; health risks; preventive medicine*

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OP24-Silica Dust and Health: A Case Study on Modeling of Dust Emissions from Mining Operations

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According to the data of the American National Institute for Occupational Health and Safety (NIOSH), silicosis disease takes first place among the most common occupational lung diseases [1]. Silicosis occurs by inhalation of crystalline silica dust [2]. Silicon is very common in nature and has many uses in various industries and occupationals. Quarry department has an important place among the main employment sectors where there is a risk of silicosis [3]. The risk of silicosis from quarries affects not only workers, but also people in all areas where dust is distribution. Basalt rock is one of the most preferred building materials due to its high strength [4]. It contains high amount of silica as 45 - 53% [5]. In this study, it is aimed to determine the distribution areas of dust caused from a basalt quarry planned to be operated in the southeast of Elazığ (Turkey) province. For this, AERMOD software which an air quality distribution modeling program was used. Permissible value of dust emission in Regulation on the Control of Industrial Air Pollution in Turkey is determined as daily 50 $\mu g/m^3$and the annual 40 $\mu g/m^3$ [6]. As a result, for the study area, the emission of daily and annual emission values of dust from quarry operation was modeled and risk areas were determined.

Keywords: *AERMOD, silica, silicosis, quarry*

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OP25- Protective effects of endemic plants against cancer and bacteria

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Infectious diseases are the main cause of deaths in the world, antimicrobial resistance is a global problem, and therefore, research of new sources of potentially effective antimicrobial agents, of natural origin is convenient.

In this respect, the antimicrobial activity of the flower and leaf extract of *Hypericum scabroides* Robson&Poulter, *Verbascum diversifolium* Hochst used for medical purpose in province Elazığ, were investigated. In this study, broth microdilution method was used in order to determine the minimum inhibitory concentration (MIC) of plant extracts against microorganisms (1), 3 gram-positive bacteria, *Staphylococcus aureus* (ATCC 29213), *Enterococcus faecalis* (ATCC 29212) and *Bacillus cereus* (ATCC 11778), 3 gram-negative bacteria, *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922) and *Klebsiella pneumonia* (ATCC 13883) and 2 fungi microorganisms, *Candida albicans* (ATCC 10231) and *Candida tropicalis* (DSM11953), were used. Cytotoxicity values of plant extracts in various cell cultures such as MCF-7, HUVEC, A549, C6 were also determined.

According to the results of this study, flower extracts of *H. scabroides* showed no significant activity, but leaf extracts showed mild antimicrobial activity on *S. aureus* and *C. albicans*. It was determined that flower and leaf extracts of *V. diversifolium* showed significant activity against *E. coli* bacteria, especially leaf extracts showed high antimicrobial effect. When the cytotoxicity values of all plant extracts were examined, IC50 value was found to be over 100 µg/mL. In this case, it can be said that the 4 extracts here are not effective in 4 different cell lines tested and do not show cytotoxic activity.

As conclusion, extracts inhibited the growth of microorganisms used in these tests at different ratios. Plant extracts do not have cytotoxic activity, but it is possible to compare cell lines in which the effects of plant extracts on the 4 different cell lines tested are comparatively in itself comparable.

***Keywords**: H. scabroides, V. diversifolium, antimicrobial, anticanser.*

Acknowledgment (Funding): Finance of this research has been provided by Firat University Scientific Research Project Council of Turkey (Project number: SYO.18.06).

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OP26- Quantitative ICP-OES Determination of Trace and Essential Elements in the Plant Specy of *Ferula orientalis*

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Some of the species belonging to the genus ferula are known to be used as traditional medicine for treating various diseases in South Asia, the Middle East, and in North Africa. Frequently consumed *F. orientalis* were purchased from local seller in May-June, 2018, from Erzurum city, Turkey. Fresh samples were cleaned with distilled water and kept in a deep freeze. The fresh samples were solubilized by using the microwave dissolution technique. In the present study, the trace and essential elements (Ca, Mg, P, Si, Na, Cu, Fe, Mn, Co,Se, Zn, B, Ba, As, Al, Cd, Cr, Pb, Ni) compositions in the *Ferula orientalis* were determined by the Inductively Coupled Plasma Optical Emission Spectrophotometer ICP – OES), and the mineral concentrations of the plant were evaluated.

According to the results, mean concentrations of all elements in the *F. orientalis*, except for arsenic, were found to be below certain legal limit values, especially arsenic levels in *F. orientalis* that were found to be above all the legal limit values. Also, the hazard quotients (HQ) of individual heavy metals in plant, except for As, revealed safe levels for human consumption. However, the HQ values of estimated inorganic As exceeded 1 in the *F. orientalis*, which may constitute a risk to public health.

This clearly indicates that each plant species has a different absorption and accumulation capacity for different metals.

Keywords: *Ferula orientalis, Trace element, Essential elements*

OP27- Unusual function of wetlands as hirudotherapy centers: An ignored threat in terms of preventive medicine

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Medicinal leeches have been used in various disciplines such as pharmacology, cosmetics, veterinary and especially medicine since ancient ages. The therapeutic effectiveness of the leeches is due to the enzymes they secrete during leech therapy (hirudotherapy). Leeches with a long history in folk medicine have also recently used in modern medicine. The U.S. Food and Drug Administration has approved the using leeches in plastic and reconstructive surgery in 2004. The Turkish Health Ministry has released the Implementing Regulation on Traditional and Complementary Medicine in 2014 covers many medicine applications including leech therapy. These approvals require use only the sterile leeches in the treatment to prevent from potential infection risks.

This study aims to discuss an ignored health treatment practice conducted in some wetlands that medicinal leeches live. The fieldwork was carried out in July 2019 in three wetlands, two (Lake Karagöl (Sülüklü) and Lake Kozağaç) in Adıyaman and one (Lake Sülüklü) in Gaziantep. On-site observations were made, notes were taken, and interviews were conducted with the people who have leech therapy in the wetlands.

Only one leech species (*Hirudo sulukii* Saglam, Saunders, Lang and Shain 2016) was found in the wetlands. Although the current health regulations don't approve, the studied wetlands are served as hirudotherapy center to large masses of people. Especially the local people often come to the wetlands with family members. Although there are some people who immerse their whole body in water, they usually dip their legs up to their knees into the water. They mix the water to stimulate the leeches and wait passively for 2-3 hours. The hungry leeches start to swim when the water mixed and reach the areas the people found. The leeches attach to legs, feet or fingers of the people and suck blood until they are full. When the leeches stop sucking, they return the bottom of the wetlands, then an intensive blood leak from each biting point occurs. Blood leakage contaminates both water and the terrestrial environment as potential source of infections. Although it is forbidden some people collect and carry leeches that suck themselves when they leave the wetlands. This illegal activity causes leech populations weaken in the wetlands.

In conclusion, leech treatment conducted in the wetlands should be controlled and forbidden to prevent the potential infections and provide sustainable leech populations. For this purpose, effective control mechanisms should be operated and awareness trainings for the people and local government institutions should be periodically conducted.

Keywords*: medicinal leeches, leech therapy, enzyme, blood, infection, awareness training.*

Acknowledgement: *This study was supported by The Scientific and Technological Research Council of Turkey (TÜBİTAK) (Project No: 118R027).*

OP28- Developments in gene therapy from past to present

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Gene therapy can be defined as altering the expression of one's genes to treat and prevent diseases. The application of the information obtained from the human genome project to pharmogenetics started the period of “the medicine reduced to the individual”.
Thus, not only the emergence and course of the disease; considering the genetic structure of the individual, appropriate medication and treatment can be arranged for everyone.
In this presentation, studies on Gene Therapy, Gene-Therapy applications and drug trials will be summarized. Again, in vivo and ex vivo gene delivery modes, the history of gene therapy and application areas will be presented. Recent developments in gene therapy drugs such as Recombinant DNA technology, Gene transfer tools, Commercially approved drugs including Gendisin, Onkorin, Cerepro and Glibera will be explained
Thus, it will bring a new perspective to the “modern pharmaceutical age ve and make promising extrapolations with new gains.
Finally, new approaches in targeted drug design will also be presented.

Key words: Gen Therapy, Recombinant DNA, Development Methods of Drug-Molecules

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OP29- Phytohormones Strigolactones: Their novel potential therapeutic activities in different chronic inflammation related disease conditions

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Strigolactones (SLs) are class of carotenoid-derived lactones and recently recognized as novel phytohormones regulating many facets of plant development. The history of SLs as phytohormones dates back to the beginings of 2010s, thereby; the number of studies evaluating the potential medicinal promises of SLs is limited. It is well established that phytohormones not only govern important physiological traits in plants but also have impacts on human physiological and pathological processes such as cell division, glucose metabolism and inflammation. In fact, uncontrolled and persistent systemic inflammation may develop into a chronic state that finally becoming one of the fundamental basis for the pathogenesis of various complex multi-factorial diseases such as neurodegenerative disorders, insulin resistance and even cancer. Recently, it is reported that SL analogs inhibit the growth and survival of breast, prostate, colon and lung carcinoma as well as melanoma, osteosarcoma and leukemic cell lines by the activation of stress related MAPKs, cell cycle arrest and apoptosis with minimal effect on survival of normal cells [1,2]. In our lab, we showed that a representative SL analog, GR24 promoted AKT activation in insulin resistant skeletal muscle cells, inhibited hepatic glucose output and downregulate the expression of rate limiting enzymes of gluconeogenesis-PEPCK and G6Pase. We also reported for the first time that GR24 induced the expression of phase II detoxifying enzymes by activating their transcription factor Nrf2 in hepatic and macrophage cells under normal and inflammatory conditions [3]. Very recently, we have also showed that SLs have the potential for transcriptional regulation of Nrf2 mediated antioxidant pathway in brain microglia and endothelial cells of cerebral micro vessels [4]. In this presentation, in addition to above-mentioned findings, we would like to discuss our current data demonstrating that SLs can be multi-potent glia-and neuro-protective agents and can be considerably effective against several neuroinflammation-related signaling cascades such as NFκB, NO/iNOS, Nrf-2, and PPARγ, in brain microglia cells and endothelial cells of blood brain barrier.

Keywords: Strigolactones, GR24, microglia, chronic inflammation, neuroinflammation

Acknowledgment: A part of this study was funded by TUBITAK, Grant No.218S814.

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OP30- Determination of Trace Metals in Henna Sold in Diyarbakir, Turkey Local Markets

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Abstract: Some medicinal plants are very important in human life. Henna is one of oldest traditional therapeutic and cosmetic products in the world. Henna has long been used in the countries of the Middle East and North Africa for its cosmetic or therapeutic properties. It has been used for the treatment of certain skin lesions and infected burns. Several of its therapeutic properties have been recently proven. Its anti-inflammatory, antipyretic, analgesic, and even tuberculostatic properties were experimentally demonstrated [1-3]. Despite its low allergic potential, some allergic reactions have been reported. Most of them were delayed-type hypersensitivity reactions and allergic contact dermatitis [1-6].

The henna may contain high risk of trace metal contamination. Therefore, the aim of the this study was to determine the content of henna brands samples commonly sold in Diyarbakir, Turkey markets were analyzed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The all analytical parameters were done.

Keywords: henna, cosmetic, trace elements, ICP-MS

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POSTER PRESENTATION (PP)

PP1-The Effects of Metformin, Ibuprofen and Acetylsalicylic Acid on Telomerase Enzyme Activity

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DNA structures that are important for the stability and replication of eukaryotic chromosomes are called “telomeres”. Telomeres shorten at each cell division and if the telomerase enzyme, which extends the telomere structure, does not show sufficient activity, the cell stops dividing at a critical length. This is seen as one of the reasons of aging. In contrast, in cancer cells where telomere is not shortened, it is largely the activity of telomerase enzyme, which allows for unlimited division. The telomerase enzyme is therefore critical for both aging and cancer. Metformin, ibuprofen, and acetylsalicylic acid used in this research are drugs that can be used by millions of people over the world, with or without a prescription. In this study, the effects of these drugs on telomerase activity in liver tissues of *Mus musculus* Swiss albino mice were investigated. Telomerase activity was measured by PCR-ELISA based method. According to the data obtained, metformin showed a slight inhibitory effect on telomerase enzyme activity in the lower doses. In ibuprofen application, there is a significant inhibitory effect when high doses are used, and a low inhibitory effect at low doses. In acetylsalicylic acid application, a slight activator effect was detected, although not statistically significant.

Keywords: *Telomerase, Metformin, Ibuprofen, Acetylsalicylic acid*

PP2-Investigation of Zinc Bonding Properties of Ramipril Using Spectrofluorometric Method

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Abstract: Metal binding properties of Ramipril (RMP), an ACE inhibitor compound was investigated using spectrofluorimetric method. Interactions of Zn (II) ion with Ramipril (RMP) in different solvent media, effects of these substances on fluorescence properties and optimum conditions were determined. Excitation and emission wavelengths were determined as λex = 252 nm and λem = 284 nm for RMP-Zn (II) complex in pH 3.0 and methanol medium, respectively. Fluorescence intensity values were measured by taking emission spectra after 25 minutes of solutions for complex formation. Under the specified experimental conditions, calibration graphs ($[Zn^{2+}]$ - F graph) are plotted and under optimal conditions the study range for the RMP-Zn (II) complex is linear in the range 0.1-1.0 µM. Limit of detection (LOD) and limit of quantitation (LOQ) were determined as 0.04 and 0.13 µM, respectively. The complex-based fluorimetric method of RMP with Zn (II) ions was applied to a zinc-containing drug (Redoxon-Zinc).

Keywords: Antihypertansive, ramipril, florimetry, zinc

Introduction: It is common to take vitamin-mineral combination drugs because of inadequate intake of vitamins and minerals in the body due to advanced age, especially in older patients who have to use antihypertensive drugs containing ACE inhibitors[1]. For this reason, it is of great importance to investigate the possibility of the combination of vitamin-mineral combination with antihypertensive drugs in combination with ACE inhibitors of iron, trace amounts of zinc, copper, cobalt and manganese, which are present in macro amounts, and to decrease the effectiveness of both drugs[2]. In the present work metal binding properties of Ramipril (RMP), an ACE inhibitor compound was investigated using spectrofluorimetric method.

Materials and Method:

Apparatus

The fluorescence spectra were obtained with Perkin-Elmer LS 55 Spectrofluorimeter. The slit width was fixed at 10 nm for excitation and 10 nm for emission monochromators. The pH of the experiment solutions were measured with METTLER TOLEDO pH-meter. A WiseCircu thermostatic bath with circulation was used to keep the temperature constant at 25ºC.

Materials

Ramipril (RMP) (Figure 1), which is one of the ACE inhibitors, was preferred as the ligand in the study based on complex formation with metabolic metals. This drug active ingredient was supplied from related pharmaceutical companies by Prof. Dr. Sibel A. Özkan (Ankara University Faculty of Pharmacy, Analytical Chemistry Department). A 10^{-3} M stock solution of RMP in methanol was prepared and used by diluting to appropriate concentrations in experimental procedures.

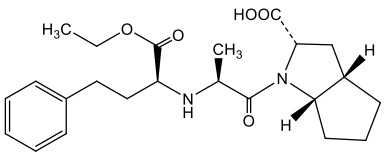

Figure 1. Molecular structure of RMP.

Procedure

To a 25 mL temperature controlled reaction cell was added appropriate volumes of Zn (II) stock solution with zinc concentrations of 10^{-6} M-10^{-5} M. To these solutions, 2.0 mL of 10^{-3} M RMP was added from the stock solution in the solvent (methanol, MeOH) in which the optimum fluorescence intensity determined for the determination was obtained, 1.0 mL of 20% ammonium

acetate solution was added. The pH of the solution was then adjusted to the optimum determined value (pH= 3.0) using 1M HCl and 1M NaOH solutions. The volume of the solutions was made up to 20 mL with the appropriate solvent (MeOH). The solution was allowed to stand at the optimum time (25 minutes) and temperature for complex formation. The excitation and emission spectra of these solutions were taken and fluorescence intensities were measured. Calibration (F-[Zn^{+2}]) was plotted at the optimal excitation and emission wavelengths determined. Under the optimum experimental conditions, this fluorimetric zinc determination method was applied to Redoxon-Zinc tablets to determine the content of Zn (II). Recovery, limit of determination (LOD) and limit of quantitation (LOQ) values were calculated.

Results and Discussion: Excitation and emission wavelengths were determined as λex = 252 nm and λem = 284 nm for RMP-Zn (II) complex in pH 3.0 and methanol medium, respectively. Fluorescence intensity values were measured by taking emission spectra after 25 minutes of solutions for complex formation. Under the specified experimental conditions, calibration graphs ([Zn^{2+}]-F graph) are plotted and under optimal conditions the study range for the RMP-Zn (II) complex is linear in the range 0.1-1.0 μM (Figure 2). Limit of detection (LOD) and limit of quantitation (LOQ) were determined as 0.04 and 0.13 μM, respectively. The complex-based fluorimetric method of RMP with Zn (II) ions was applied to a zinc-containing drug (Redoxon-Zinc).

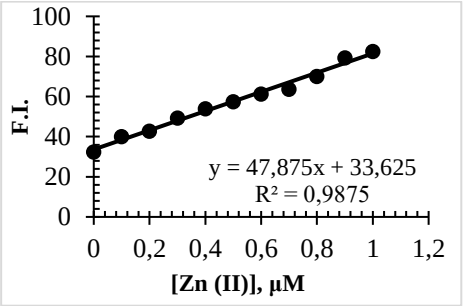

Figure 2. Calibration graph of RMP-Zn (II) complex

Calibration graphs do not go through zero, since RMP also has a slight fluorescence intensity at the excitation and emission wavelengths specified for the complex, and it is not possible to reset this fluorescence intensity. The accuracy and precision of the method developed for the RMP-Zn (II) complex was determined by three-replicate (n = 3) analysis of the samples. The recovery studies real that the suggested fluorimetric method was useful for the determination of the interactions between the Ramipril and Zn (II) ion by the fluorimetric method with recovery percent values between 96 and 105. The accuracy of the method, expressed as the relative mean error, is in the range of 1.96-7.14% for the RMP-Zn (II) complex. The percentage relative standard error at low values shows that the method developed for the determination of the interaction between RMP and Zn (II) ion has good precision and reproducibility.

Conclusion: RMP and Zn (II) ions formed a complex by interacting with the optimum experimental conditions determined especially in MeOH medium. But the complex-based fluorimetric method of RMP with Zn (II) ions was applied to a zinc-containing drug (Redoxon), but no suitable and successful results were obtained. In this case, it was concluded that there was no harm in taking the drug as the RMP-Zn (II) complex in water, which is a physiological solvent medium, could not be formed and the zinc content of Redoxon could not be determined by the developed fluorimetric method. It can be said that drug active substances are good ligands which

can be used for the determination of trace amounts of metals and this study will be a good example for the studies in this field. In addition, it has been shown that antihypertensive drugs and zinc-containing drugs do not interfere with each other.

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PP3-The Synthesis and characterization of Pillar[5]arene triazole units as Supramolecular Drug Delivery Systems

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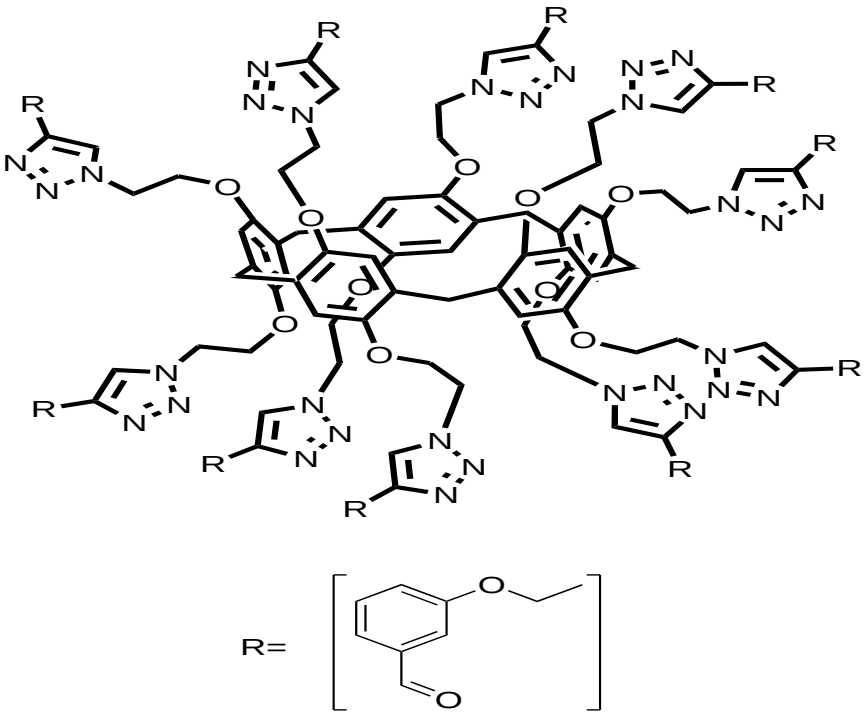
Pillar[n]arenes allow intermolecular interaction and complex reactions. In the intermolecular interaction, they can form host-guest complexes with linearly shaped alkanes. In particular, stable host-host complexes containing FON elements can be obtained by hydrogen bonding with small molecules of radius. However, compared with other conventional macrocyclic host compounds, anti-cancer studies are still limited to about 20 articles.

Hydroquinonbis(2-hydroxyethyl) ether is designated as starting material in this context and treated with CBr_4-CI_4 to give the hydroquinonbis(2-bromoethyl) ether and hydroquinonbis(2-iodoethyl) ether intermediates. This compound will then be treated with paraformaldehyde and $BF_3OEt_2/FeCl_3$ under appropriate conditions to form the main skeletons of Pillar[5]arene.



Keywords: *Pillar[n]arene, triazole, synthesis, characterization.*

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PP4-Investigation of the Electrochemical Behavior of Ascorbic Acid with Modified Electrode Using Cyclic Voltammetry

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Ascorbic acid (AA; also known as L-ascorbic acid, antiscorbutic vitamin and vitamin C) is an important water soluble vitamin. Vitamin C is one of the most important vitamins for the pharmaceutical and food industries. Additionally, ascorbic acid has an important place in the body. Ascorbic acid is a powerful antioxidant. Therefore, the content of ascorbic acid in biological fluids can be used to determine the amount of oxidation stress in human metabolism associated with diseases such as cancer, diabetes and hepatic. There are many methods for the determination of AA. It is very important to determine the ascorbic acid which is electrochemically active by using voltammetric method [1, 2].

In this study, glassy carbon electrode (GCE) was modified with L-cysteine and o-phenylenediamine (*o*-PDA) to form a new electrode. Optimization conditions of modified electrodes were determined. In order to determine the optimum conditions, the electrochemical experiments were performed in different potential ranges, solvents, scan rates and cycles.

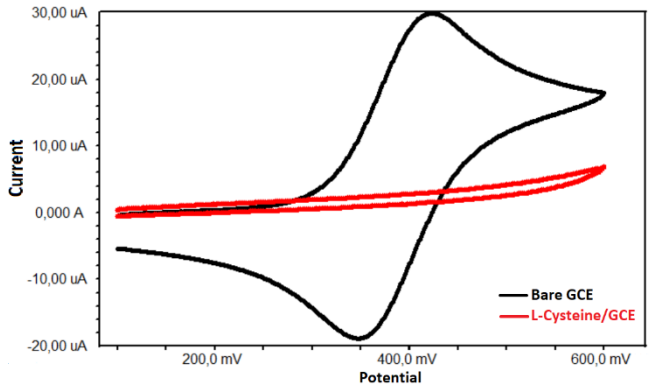

Figure 1: Comparison for ferrocene voltammograms at the (black line) bare GCE and (red line) modified GCE surfaces in non-aqueous media. Scan rate:100 mV/s.

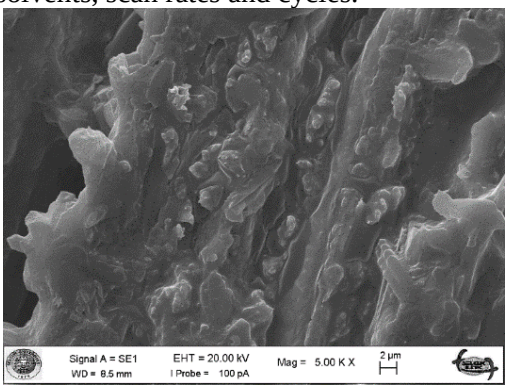

Figure 2: SEM image of modified glassy carbon electrode surface with L-cysteine

Electrochemical behavior of ascorbic acid was investigated using these electrodes. In addition, the electrochemical behavior of these modified surfaces in fresh lemon juice and commercially available vitamin C tablets was investigated. The modified surfaces were examined by SEM and TEM analyzes. As a results, it has been determinated that L-cystine and o-phenylenediamine attach to electrode surface. The results were also supported by EIS and SWV analyzes.

Keywords: Ascorbic Acid, Cyclic Voltammetry, Glassy Carbon Electrode, Modification

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PP5-Amino acid-derived polymeric microbeads for preconcentration of mevinphos pesticide from environmental water samples followed by gas chromatography-mass spectrometric detection

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Organophosphorus pesticides (OPPs), which are a class of effective pesticides used to control agricultural pests, have been widely used worldwide as agrochemicals. Some are highly toxic to human and other non-target environmental matrices without selectivity. Due to their broad applications in agriculture or insect control in public spaces, OPPs and their metabolites have been frequently detected in vegetables, fruits, water, soil and other environmental matrices[1]. Mevinphos is an organophosphate insecticide that acts as an acetylcholinesterase inhibitor to control insects in a wide range of crops. Because of the relatively high solubility of mevinphos in water, rapid, selective and accurate analytical techniques should be developed for its determination in water.

In this study, a solid-phase extraction (SPE) procedure using cartridges prepared from poly (divinylbenzene-N-methacryloyl-L-tryptophan methyl ester) [poly(DVB-MATrp)] microbeads[2] was used for the extraction of mevinphos from water samples. Various experimental parameters affect extraction efficiency were optimized, such as the sorbent amount, the type of desorption solvent, pH, desorption solvent flow rate and sample volume. The affecting parameters in the adsorption and desorption steps were assessed and optimized via response surface methodology (RSM). Under the optimal conditions, the limit of detection (LODs, S/N = 3) was determined to be 0.028 µg/L. The recovery experiments were carried out by spiking target analyte at two concentration levels to validate the accuracy of the proposed method, and the recoveries for mevinphos were in the range of 100-116%. The results show that the proposed method in this work can be successfully used to analyze mevinphos residue in environmental water samples.

***Keywords**: mevinphos, solid phase extraction, microsphere, GC-MS, preconcentration*

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PP6-Analysis of Toxic Gasses in Air Samples by Dispersive Liquid-Liquid Micro-Extraction

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Monitoring of volatile organic compounds (VOCs) in air samples has received great attention in recent years due to their harmful effects on humans and the environment. There are various types of pollutants volatile organic compounds stand out as compounds with serious effects on human and environment. VOC amounts in the air vary with time and place. Therefore, the measurement techniques to be developed should be appropriate and rapid to instant measurements (1).
Among the VOCs, styrene, ethylbenzene, xylenes, toluene and benzene have been identified as the most health-causing compounds (2). Since these compounds are generally low in concentration, they can be analyzed following appropriate preconcentration technique. Different analysis techniques are developed for this purpose but most of them requires expensive equipment. Sorbent based active and passive sampling systems are generally used for the analysis of these compounds in air samples. Some of these require a combination with another enrichment technique and the commercial adsorbents used in these techniques results in high costs (3). This makes it difficult to monitor air quality effectively. In this study, a low cost and simple method was developed for the analysis of benzene, toluene, ethyl benzene, p-xylene and o-xylene in air samples.
For this purpose, firstly the prepared gas samples were passed through the aqueous solution in which the extraction solution was dispersed by using a vacuum pump. In this prosedure the analytes were transferred to the organic phase. After this process, the extraction solvent in the organic phase was separated by centrifugation and this part was injected into the GC-FID system using insert vials. 1-undecanol, 1-dodecanol, hexane, carbon disulfide, tetrachloroethylene and nitrobenzene were tried as extraction solvent and the best yield was determined by using nitrobenzene as an extraction solvent. The optimization of the method was performed and the calibration curves of each targeted VOCs were performed under optimum conditions. Analytical figure of merits of the proposed method for the targeted VOCs was determined.

Keywords: *volatile organic compounds, air sample analysis**,** dispersive liquid liquid microextravtion, BTEX*

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PP7-Determination of Some Volatile Organic Compounds in Synthetic Urine Sample by Thin Film Microextraction

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Volatile organic compounds (VOCs) can be produced from the human body and released through breath, blood, skin, urine, and feces. As these VOCs are thought to reflect the physiological and metabolic status of the individual, they could be monitored to assess the individuals with cancer. Also, VOCs can be conveniently and reliably detected by GC-MS or gas sensors, which highlights the easy and simple application [1].

Thermal desorption (TD) fundamentally involves collecting VOCs onto a sorbent, and then heating this sorbent in a flow of gas to release the compounds and concentrate them into a smaller volume. Thermal desorption is a well-established and regulated sample extraction technique for monitoring VOCs and although the number of applications is recently growing in in vitro and in vivo applications.

Thin film microextraction (TFME) is an analytical tool that has been demonstrated to be suitable for integrated sampling and sample preparation of a wide variety of routine applications [2]. Compared to the traditional microextraction techniques, the most important advantage of TFME is its enhanced sensitivity due to the relatively larger extractive phase dispersed over a larger surface area. The technique, in this way, facilitates fast extraction and high extractive capacity.

In this study, different sorbent materials were tested to determine the amount of VOCs in synthetic urine and method optimization parameters were investigated.

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PP8-VOCs Analysis as a Diagnostic Tool for Asthma Disease

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Asthma is a chronic inflammatory disease of airways which shows heterogeneity in terms of clinical molecular profiling. The occurrence of asthma depends on environmental exposures and genetic factors of patients. Adult asthma can be divided into many subgroups. Cellular and molecular approaches are the most used ones in forming subgroups. The aim of the study is defining molecular asthma in different clinical asthma patients by biomonitoring of Volatile Organic Compounds (VOCs) in exhaled breath. Many studies have described that VOCs profiling is an important tool for the monitoring of lung diseases [1].

The concentration of certain VOCs in breath (so-called breath markers) can be related to physiological and pathological conditions [2]. Breath analysis is an emerging field aiming for the next generation of hand-held and non-invasive medical diagnostic and monitoring devices. The needle trap device (NTD) technique is a new microextraction method for sampling volatile organic compounds (VOCs) from various types of samples such as air, breath or urine. NTD technique is suitable for laboratory automation and on-site sampling compatibility with convenient coupling to analytical instrumentation.

In this study, the NTD based sensitive analysis method was developed and applied for the analysis of volatile organic compounds in healthy subjects and asthma patients.

Keywords: *Volatile organic compounds, asthma disease, needle trap device, breath analysis.*

Acknowledgement: *The authors gratefully acknowledge the Turkish Ministry of Science TUBITAK (116S196) and Ege University for financial support.*

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PP9- Bioindicators as the natural indicators of environmental health

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Bioindicators are living organisms that respond to environmental pollution by changing life functions or accumulating toxins in their bodies. Different definitions can be made for bioindicators according to their effect mechanisms and types. One is; bioindicators are species that develop under certain conditions and detect the deterioration of natural balance. The other is; bioindicators are plant and animal species which are extremely sensitive and show reaction against certain environmental condition. The organism indicates the health of the ecosystem while inducing its own health. A wide variety of living organisms can be used as bioindicators such as lichens, bees (pollens), bryophytes, mussels, benthic organisms, parasites, fishes, macrophytes, marsh frog and crayfish2.
Information about the level of environmental pollution can be obtained by measuring the levels of stress proteins produced by microorganisms that can be used as indicators of toxins in the ecosystem when exposed to certain pollutants. Indicator organisms are used for monitoring heavy metal uptake, excretion, bioavailability and toxic effects and also can give an idea about the level of pollution in the environment according to their working mechanisms and storage of various toxic substances, just like microorganisms. Those bioindicators, consumed by human and animals as nutrients, may be dangerous for health as a result of ingestion of harmful substances that they contain1.
Bioindicators are useful to determine pollution especially when chemical analyzes restricted or cannot be done. In addition; they are helpful to determining the levels of pollutants and contributing to the prevention of pollution will provide significant benefits especially in the initial stage of pollution3.

Key words: environmental pollution, bioindicator

Giriş: Ekosistem içinde zehirli gazların, toz, duman, sis, koku ve katı parçacıklarla bunların karışım miktarlarının toprak, su ve atmosferde kabul edilen bazı değerlerin üstüne çıkmasına "Çevre Kirliliği" denir. Çevre kirliliği; *çevre özelliklerine* (fiziksel, kimyasal ve biyolojik kirlenme), *çevre unsurlarına* (hava, toprak, su, ısıl, radyoaktif, gıda, gürültü, elektromanyetik, görüntü ve ışık kirliliği) ve *kaynaklarına* (endüstriyel, kentsel ve tarımsal kaynaklı çevre kirliliği) göre sınıflandırılabilir. Çevre kirliliğini kontrol altına alabilmek için birçok teknoloji ve bilimsel yöntem geliştirilmekle birlikte günümüzde en çok kullanılan yöntemlerden birisi biyoizlemedir.
Doğal olarak ortaya çıkan biyoindikatörler, ortamdaki doğal ekosistemin sağlığını taramak için kullanılan bitkisel, hayvansal ve mikrobiyal göstergelerden oluşan canlı organizmalardır. Biyoindikatörlerin ortamdaki ışık, su, sıcaklık ve askıda katı madde iletimi gibi varlığını yöneten belirli faktörler vardır. Ekolojik değişkenliğe karşı dayanıklılıkları nedeniyle biyoindikatör türlerinin uygulanması ile belirli bir bölgenin doğal durumunu veya kirlilik seviyesini / derecesini tahmin edebiliriz. Biyoindikatör kullanmanın avantajları ve dezavantajları Tablo 1'deki gibidir:

Biyolojik İndikatörler

Biyolojik indikatörler üç temel gruba ayrılmaktadır:

1.İndikatör tür veya belirtici tür: İndikatör tür, ekolojileri bilinen türler olup ekosistemde azalmaları veya çoğalmaları ekosistem üzerine bir çok etmenin (iklim değişikliği,çeşitli kirleticilerin ortama karışması gibi) baskısını gösterir.

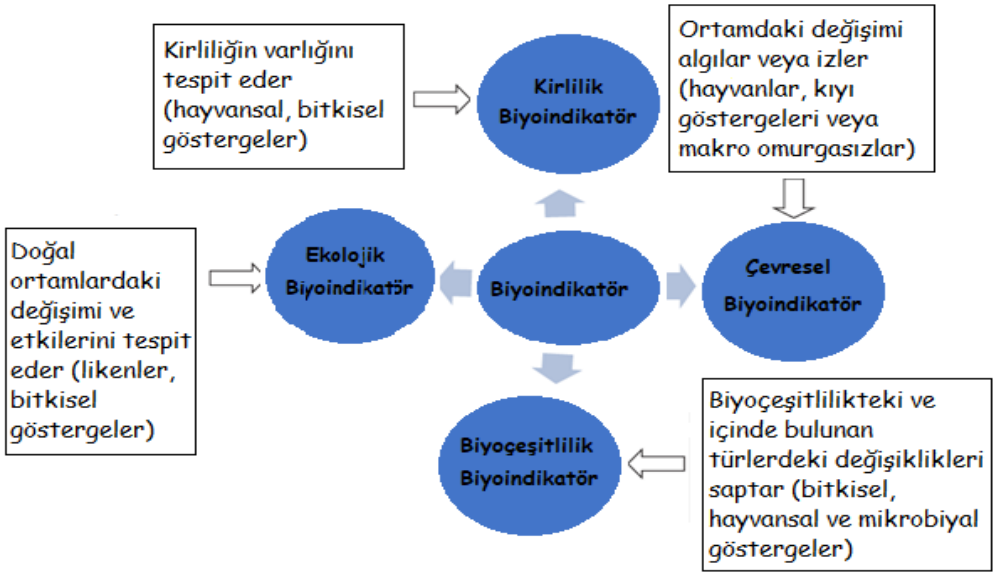
2.Biyomonitorler: Çevrelerinden belli bir süre içinde belli toksinleri vücuduna alan ve dokularında biriktiren bitki veya hayvan türleridir. Bu türlerin ortamdaki varlıklarının saptanması ile pasif olarak kullanımları ortamın koşulları hakkında bilgi verir. Hassas ve biriktirici biyomonitorler olmak üzere ikiye ayrılır.

3.Test organizmaları: Bunların ekosistem çalışmalarında kullanımları sınırlıdır.Test organizmaları ile yapılan deneylerle bu organizmaların belli maddelerle birlikte aynı ortamda bulunabilmeleri denenerek çeşitli testlerin standardizasyonu sağlanır.

Tablo 1. Biyoindikatörlerin Avantaj ve Dezavantajları

Biyoindikatörlerin Avantajları	Biyoindikatörlerin Dezavantajları
Çalışma materyali doğadan alındığı ve geniş alanlara uygulanabildiği için maliyeti düşüktür.	Standardizasyon sınırlı şekilde yapılabilir.
Kirleticinin biyolojik etkisi hakkında kalitatif bilgi elde edilebilir.	Tekrar edilebilirliği birçok çalışma alanı için oldukça düşüktür.
Ölçümün yapıldığı zaman aralığından önceki birikim hakkında da bilgi sağlar.	Kesin ölçümler ancak sınırlı özel konularda yapılabilir, bastan basa kantitatif veriler elde etmek çoğu zaman mümkün değildir.
Biyoindikatör organizmaların çalışmalarda kullanılmak üzere elde edilmesi kolaydır.	Spesifik reaksiyonlar ve bunların bireysel etkileri, sahada sadece bir çeşit kirletici olduğu varsayılamayacağı için ölçülemez.
Bakım ve servis gibi, maliyeti ve araştırma süresini değiştirecek ekstra külfetleri yoktur.	Havadan ya da topraktan bulasan kirleticileri kesin sınırlar içinde bağımsız olarak ayıt edebilmek zordur.
İnceleme yapılabilmesi için bir güç kaynağı ya da enerji sağlayıcı ekipmana ihtiyaç duyulmaz.	Enstrümantal yöntemlere göre sonuç almak daha uzun sürer.
Kirleticilerin hem sinerjistik hem de antagonistik etkileri incelenebilir.	Çoğu zaman biyoindikatör organizmanın metabolizması ve konu ile olan ilgisi hakkında detaylı bilgiye sahip olunmalıdır
Farklı biyolojik çalışma disiplinleri ile kombine edilebilir.	Diğer faktörlerden (iklim, diğer kirleticiler vb.) bağımsız olarak bir faktörün etkisi incelenemez.

Biyoindikatör Çeşitleri: Biyoindikatörler halihazırda, biyolojik etkileri gözlemlemek ve insan etkilerini değerlendirmek için çeşitli kuruluşlar (Dünya Koruma Birliği, Uluslararası Doğa Koruma Birliği) tarafından kullanılmakta ve desteklenmektedir (Şekil 1).



Şekil 1. Biyoindikatörlerin alt tipleri.

Bitkiler, çevresel gerilemelerin öngörülmesi ve tanınması için çok hassas araçlar olarak kullanılmaktadır. Son zamanlarda sanayileşme ve kentleşme nedeniyle su kirliliği ve su kirliliği sorunu yoğunlaşmıştır. Deniz bitkileri, hareketsiz oldukları ve doğal çevreleriyle hızlı bir şekilde denge sağladıkları için okyanus ortamının durumunu tahmin etmek için değerli bilgiler sağlarlar. Likenler (Cyano bakterileri, algler ve / veya mantarlar arasında bir simbiyoz) ve briyofitler (kara yosunları) hava kirliliğini izlemek için sıklıkla kullanılır. Hem likenler hem de briyofitler kökleri, tırnak derileri olmadığı ve havadaki bütün girdilerini iklimlendirmeden hemen elde ettikleri için hava kalitesini tespit etmede güçlü biyoindikatörlerdir. Genellikle ağaçların ve kayaların gövdelerinde bulunan likenler, hem alglerden hem de mantarlardan oluşur. Orman yapısındaki, hava kalitesindeki ve iklimdeki değişiklikleri de dahil olmak üzere ormanlardaki ekolojik

değişikliklere tepki verirler. Çevresel stres, kükürt dioksit (SO_2), kükürt ve azot kirletici madde (N_2) seviyesindeki artışlar gibi değişikliklerin neden olduğu ormanlardaki kirlilik likenlerin kaybolmasıyla belirlenebilir. *Wolffia globosa*, kadmiyum hassasiyetini göstermek için önemli bir araçtır ve aynı zamanda kadmiyum kontaminasyonunu belirtmek için de kullanılır.

Temel olarak tatlısu ve karasal habitatlarında meydana gelen değişikliklerden etkilenen kurbağalar aynı zamanda çevre kalitesinin ve çevredeki değişikliklerin biyoindikatörleridir. Bu onları ekolojik kalite ve değişim konusunda önemli biyoindikatörler yapar. *Alona guttata, Mesocyclops edax, Cyclops, Aheyella* gibi zooplanktonlar bölgeye dayalı kirlilik göstergeleridir. Su omurgasızları, su kütlelerinin dibine yakın yaşayan dip besleyicileri (Benthos veya makro omurgasızlar olarak da bilinir) biyoindikatör olma eğilimindedir. Bu tür biyoindikatörler, laboratuvarda ayırt etmek zor olmadıkları, bir yıldan fazla bir süre yaşadıkları, hareket kabiliyetini kısıtladıkları ve ekolojik koşulların bütünleştiricileri oldukları için özellikle su sağlığının güçlü göstergeleri olabilirler.

Mikroorganizmalar okyanus biyokütlesinin önemli bir parçasıdır ve deniz ekosistemindeki verimlilik ve besin döngüsünün çoğundan sorumludur. Mikroorganizmalar hızlı bir büyüme oranına sahiptir ve düşük seviyeli kirletici maddelere ve diğer fizikokimyasal ve biyolojik değişikliklerle bile reaksiyona girer. Mikroorganizmalar genellikle su ve karasal ekosistemlerin sağlık göstergeleri olarak kullanılır. Bolluklarından dolayı test edilmesi kolaydır ve hazırdır. Kadmiyuma ve benzen kirleticilere maruz kaldığında bazı mikroorganizmalar, erken uyarı işaretleri olarak kullanılabilecek stres proteinleri olarak bilinen yeni proteinler geliştirir. Mikrobiyal göstergeler, biyolüminesan bakteri kullanımı da dahil olmak üzere sudaki çevresel kirleticileri tespit etmek için çeşitli şekillerde kullanılabilir. Sulardaki toksinlerin varlığı, bakterilerin yaydığı ışık miktarında değişikliklere neden olabilecek toksinlerin varlığından kaynaklanan veya rahatsız eden mikropların sindirim sistemindeki değişiklikler ile kolayca izlenebilir. Mevcut diğer geleneksel testlerle karşılaştırıldığında, bu testlerin izlenmesi çok kolaydır; bununla birlikte, sınırlamaları, toksinlerin varlığından dolayı organizmadaki değişiklikleri gösterebilmeleridir.

Sonuç: Biyoindikatörlerin çok yönlü avantajları kısıtlamalarından ağır basmıştır. Biyoindikatörler yardımcı, nesnel, basit ve tekrarlanabilirdir. Biyoindikatörler, belirli bir biyolojik toplulukta meydana gelen değişiklikleri değerlendirmek için hücreden çevresel seviyeye kadar çeşitli ölçeklerde kullanılabilir. Biyoindikasyon ve biyo-gözlemlemenin, dış faktörlerin bir ekosistem üzerindeki etkilerini araştırmak; kirlenmiş ve kirlenmemiş alanları ayırt etmek için ümit verici yöntemler olduğu sonucuna varılabilir.

Hızla gelişen teknoloji çağında, dünyamızda biyoindikatörler kullanılarak çevre kirliliğinin belirlenmesi ve önlenmesi sağlanabilmektedir. Çeşitli kirlilik kaynaklarına karşı farklı tepkiler ve reaksiyonlar veren farklı biyoindikatörler ortamdaki kirliliğin belirteci olduklarından çevre kirliliğinin kontrol altına alınmasını mümkün kılmaktadır.

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PP10-Chemical and Techno-Functional Properties of Different Pumpkin Seeds (*Cucurbita pepo* L.) Flours

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The pumpkin (*Cucurbita pepo* L.) belongs to Cucurbitaceae family and genus Cucurtibita and has many species. Pumpkin seeds are used in food industry, medicine and cosmetic industry.In addition, pumpkin seeds was used as prevention of prostate, hypertension, hypercholesterolemia, rheumatism, bladder stone and diabetes in traditional medicine in Turkey for a many years. Pumpkin seeds are often consumed as snacks in our country, however their use is limited in the food industry. Bakery products are known to be the group of food that has the highest consumption in the world. Recently in our country bakery industry has developed, besides variety of products, to aim for increasing nutritional and functional properties with some flour additives like vegetable flours, fruit and fruit seed flours and cereal flours. Flour additive that will be added into the food product during the process affects the functional and technological properties of the end-product significantly. Demand has increased on natural food additive ingredient products in recent years leading to increased functional food consumption. In the present study, three different pumpkin seeds peculiar to Turkey were used and both the chemical (humidity, ash, protein, fat, dietary fiber, carbohydrate and energy) and techno-functional properties (water absorption capacity, water solubility, emulsion capacity and emulsion stability) of pumpkin seed flour (PSF) were determined. As a result, it was determined that PSF have high fat, protein, dietary fiber and ash content. The fact that the dietary fiber content of the PSFs were found high made their water absorption capacity values (107.05-131.95%) to increase. It is considered that the high water absorption capacity of pumpkin seed flour is very important in terms of bringing in functional properties to bakery products. On the other hand, emulsion capacity value of PSFs was determined to be at medium levels in comparison with the values determined in other studies. Due to this reason, it is considered that PSFs have the potential of being used as an alternative emulsifier in bakery products. As a result, pumpkinseed have a significant nutritional and techno-functional properties due to its high amounts of total dietary fiber, protein content, water absorption capacity and emulsion capacity value. Therefore, it might be used in daily diet and food formulations as a food additives or ingredients in different food industries.

Keywords: *Cucurbita pepo* L., pumpkin seed flour, functional properties, food industry, functional ingredient

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PP11-Assessment of HPLC-FLD Method for Determination of Trastuzumab

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Cancer immunotherapy is one of the adjuvant methods of modern medicine for cancer treatment[4]. Monoclonal antibodies are more commonly used in these therapies than vaccine and cellular therapy. Breast cancer is the most common cancer in women and its prevalence in our country has doubled in the last 20 years[3]. Trastuzumab (Herceptin, Roche) is a humanized monoclonal immunoglobulin gamma 1 (IgG1) antibody targeting HER2. The FDA first approved this mAb in 1998 and by the European Union Medicines Agency (EMA) in 2000[5]. In present study, it was planned to evaluate the bioanalytical methods for Trastuzumab and then, to develop a new method for its determination in serum samples[1,2].

Present study deals with a HPLC-FLD method for the detection of total Trastuzumab in rat serum. Trastuzumab was isolated from rat serum using protein G column and the calibration curve was constructed by using total peak area. Although the linearity was excellent (R = 0.999) in the range of 5.0 to 120 µg/mL concentration levels, optimization studies were necessary to improve the peak resolution. The influence of the experimental parameters on the peak area and its shape were investigated and then, the eluent used in sample preparation step was changed as PBS since better recovery values were obtained.

Overall results indicate that the run time is relatively high and multiple peak formation and poor resolution limits the selectivity of the method but, the HPLC-FLD can provide an alternative to ELISA for the bioanalysis of Trastuzumab.

***Keywords**: Trastuzumab, Monoclonal antibody, HPLC, Fluorescence Detector*

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PP12-Determination of Trastuzumab in Serum Samples by using LC-Q-TOF-MS

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Antibodies are the most effective components of humoral immunity. The most common Ig class used for biopharmaceutical monoclonal antibodies (mAbs) is immunoglobulin G (IgG) with a characteristic Y-shape. Trastuzumab (Herceptin, Roche) which is directed against HER2, is a humanized IgG1 antibody. This mAb inhibits proliferation and encourages cell death via extracellular and intracellular mechanisms and considered as natural drugs[1,2].

In the quantitation of mAbs, Liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) is a better alternative to ELISA. The LC-MS/MS technique is suitable to detect the compounds up to 2000 Da and considering that mAbs are typically 150 kDa, an enzymatic digestion is vital for accurate determination and trypsin is widely used for this purpose[3,4].

Initial studies include qualitative analysis of LC-Q-TOF by identifying peptides frequently analyzed in the literature. It is known that large mass molecules ionize such as M^+, $[M + H]^+$, $[M + 2H]^{2+}$ in MS analysis. In this study, the sample containing Trastuzumab was digested into the peptides by tryptic degradation. Identification studies were carried out by a series of steps including purification, denaturation and alkylation and then, tryptic digestion of Trastuzumab on the magnetic bead. Total ion chromatograms were recorded to select the signature peptide ions to identify qualitative and quantitative manner. As far as PTNGYTR signature peptide is concern, with the aid of LC-Q-TOF technique, the quantitative analysis of Trastuzumab is likely provided that m/z 402.3566 on is employed.

The peptides obtained after tryptic digestion were injected into the LC-Q-TOF-MS system having C18 column at a flow rate of 0.3 mL/min. The linearity was achieved in a rather narrow concentration range of PTNGYTR signature peptide. Further studies will include a chemometric approach for optimization of the parameters to obtain a wider concentration range.

Keywords: Trastuzumab, Monoclonal antibody, LC-Q-TOF-MS, Tryptic digestion

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PP13-Electroanalytical Method Development for Trastuzumab Determination

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One of the important aspects of modern medicine combined with cancer immunotherapy is to use for cancer treatment. Monoclonal antibodies (mAbs) are widely used in these treatments more than vaccine and cellular treatment methods. These mAbs have impact on cancer cells over three different mechanisms[1]. The first pathway includes the inhibition of factors and receptors that activate the signaling mechanism of cancer cells using antibody binding, cleavage and angiogenesis. Other two mechanisms are the antibody bound cellular cytotoxicity and complement-dependent cytotoxicity with complement activation[2].
In the present study, an electroanalytical method was developed for Herceptin (Trastuzumab) via its interaction with HER2 which was immobilized electrode surfaces. Electrochemical impedance spectroscopy (EIS) method was utilized for this purpose and a pencil graphite electrode (PGE) modified with graphene oxide (GO) and multi-walled carbon nanotubes (MWCNTs) and their gold nanoparticles (Au np) were used. After each modification, CV and EIS measurements were taken for their characterization. Surface morphology was examined by the SEM measurements after each procedure applied to the electrode surface.
The electrodes have been exposed to HER2 adsorption for 12 hours and then, all the electrodes were immersed in the Herceptin solution for specific interactions. ΔR_{ct} values were calculated according to EIS measurement results in order to see how far the Herceptin is bound to the HER2. The best performance was obtained with MWCNT and further studies were conducted with this electrode. The linear calibration curve was constructed in the range from 0.25 to 1.00 µg/mL Herceptin (R^2 = 0.999). The LOD and LOQ were calculated as 9.0 ng/mL and 30 ng/mL, respectively.
As a result, significant differences in conductivity and resistance were observed by binding of much larger molecules such as HER2 and Herceptin to the surface. It was observed that the determination of Trastuzumab could be made by using the interaction of HER2-Trastuzumab for the first time electrochemically.

Keywords: Trastuzumab, Her2, Electrochemical Impedance Spectroscopy (EIS), Cyclic voltammetry (CV), Scanning Electron Microscopy (SEM)

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PP14-Quick, Easy, Cheap Thin Film Extraction System for the Determination of Endocrine Distruptor Pesticides in Food Samples

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One of the biggest factors threatening public health today is the toxic chemicals found in foods. Especially, pesticides used in food production have left a residue in foods, which has become an important issue in today's food safety regulations. Food safety can be described as, the aim of ensuring healthy and reliable food production, transportation, storage, distribution and consumption of the foodstuffs.

In our country, inspection, monitoring and control of agricultural products and all kinds of foodstuffs are performed by the Ministry of Food, Agriculture and Livestock. Supervision and monitoring of pesticide residues in foods is carried out by Provincial Food Control laboratories operating under this ministry. These laboratories are using high-cost standard methods, which involve long-lasting, complex analysis steps for sample preparation to perform analysis of pesticide residues in foodstuffs. These methods, which are mandated by European Union accredited laboratories, increase the extra cost per analysis. Kits and chemicals used are collected collectively from abroad and millions of foreign currency are paid to foreign markets for pesticide residue analysis every year.

In order to solve these problems in pesticide analysis, it is aimed to develop an inexpensive, fast, easy and green thin film microextraction (TFME)[1] method which may be an alternative to existing techniques for the sample preparation step.

In this study, optimization of an analytical method for determination of five types of pesticides by extraction on polyaniline-coated TFME rods in grape juice samples, followed by detection by gas chromatography was described. Chlorpyrifos, Penconazole, Procymidone, Bromopropylate and Lambda-Cyhalothrin species have been selected as endocrine-disrupting pesticides.

During the sample preparation phase, TFME rods were soaked in 2ml samples containing target pesticides and the analytes were extracted for 90 minutes. For the desorption stage, the rods were then dipped for 10 minutes into a suitable solvent and three parallel extractions were made for each TFME blade. With respect to extraction process, experimental parameters such as adsorption and desorption time, salt effect, type of desorption solution have been optimized. Surface morphologies of TFME rods have been characterized by scanning electron microscopy (SEM), and their thermal strength has been studied by thermal gravimetric (TGA) analysis.

The regression coefficients of the calibration curves are at least 0.99. The linear operating range is in the range of 0.1-10 ng mL^{-1} concentration and the inter-day reproducibility value is not above 20%. The detection limits are in the range of 0.02-0.64 ng mL^{-1} concentration. The method developed in this thesis study offers an inexpensive alternative to the production of TFME rods. Within the scope of the thesis, a high selective, robust, fast and precise measurement was carried out with the 96-well TFME system in the laboratory at a very low cost.

Keywords: Thin Film Extraction, Polyaniline, Pesticide, Chromatography

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PP15- Comparative Study of Various Methods for Extraction of Lung Cancer Biomarker Metabolites in Urine Samples

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Lung cancer is one of the cancer types which mostly leads to deaths worldwide. However, diagnosis can be made only in the later stages of the disease and this not only reduces the treatment chance, but also increases the cost. Moreover, expensive imaging techniques used for diagnosis in patients who have lung cancer risk, cannot give reliable results. For this reason, these symptoms must be confirmed by biopsy and histopathological examinations which discomfort the patient. New techniques are still being sought apart from bedside and non-invasive techniques. In the early diagnosis of lung cancer, some changes might occur in the level of certain metabolites when blood contacts with urine. Therefore, studies reagarding that these certain metabolites could be significant biomarkers has been increasing.

While the metabolomics studies in biological matrix are examined, biomarker groups are mostly analyzed by liquid and gas chromatographic techniques. The sensitivity of these techniques were improved using mass spectroscopic detectors (MS, MS / MS, QTOF, MALDI TOF) [1-3]. However, the most important problem for the clinical use of these assays is the use of preconcentration and pre-seperation methods that can lead to desired sensitivity, support the diagnosis in the biological environment and provide the reproducibility.

The main objective of this study is to develop reliable and accurate extraction method for determination of lung cancer biomarker metabolites in urine samples. Different liquid-liquid extraction procedures using polar solvents namely, methanol, acetonitrile, dicloromethane and ethyl acetate were tested for the determination of polar metabolites by liquid chromatography tandem mass spectrometry. Multiple reaction monitoring in the negative ionization mode with ESI source was used for detection of components. Calibration curves were linear with correlation coefficients above 0.98. The RSD values were changed in the range of 3 – 15%. The accuracy of the method was tested with spiked urine samples and the obtained data exhibited recoveries were higher than 70% for the extraction of thirteen metabolites in urine samples.

Keywords: *Lung Cancer, Biomarker, Metabolite, Urine*

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PP16-Nutritional Perspective of Fractionation Analysis in Food Samples

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Essential elements contribute to the structure and functions of many metallo-proteins and enzymes that play very important biological roles. Zinc, manganese, magnesium, and calcium are essential elements for all known living organisms including humans and other animals. The elements mentioned above can be often taken with diet.
The elemental composition data are important in food analysis to establish limits for human exposure. In this scope, there are numerous studies dealing with total element determination in various food matrix. On the other hand, the biological behavior of a given element strongly depends on the chemical form in which this element occurs in the biological sample. Consideringly, fractionation studies for elements are more informative than total element determinations for all types of samples in order to realize bioavailability and toxicity of elements. Considering food analysis, fractionation studies are more elucidative than total element determinations to comprehend bioavailability and toxicity of elements.
In this study, some food samples (olive, olive oil, milk, milk products, food additives, wheat) were investigated by fractionation approach. The distribution of some elements in various fractions of foods were separated and quantificated by atomic spectroscopic techniques.

Keywords: *Fractionation analysis, essential elements, bioavailability, toxicity*

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PP17- Microwave Mediated and Concentrated Sunlight Green Synthesis of Nontoxic Silver Nanoparticles

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During the past few years, there is increasing interest in plants that show potential, such as anti-inflammatory, antimicrobial, anticancerogenic or catalytic activity, in the field of nanotechnology [1]. Silver nanoparticles (AgNPs) were considered to have important and promising characteristics suitable for various biomedical applications [2]. However, the present study focuses on the utilization of basil, turmeric, galangal and licorice plant extracts for microwave and concentrated sunlight mediated green synthesis of silver nanoparticles. In the microwave system, two parameters, i.e., temperature and time were optimized for a rapid biosynthesis. In the concentrated sunlight system, mixing and time were examined. After completion of the synthesis, the presence of a maximum peak at the wavelength of 450 nm by UV-vis spectroscopy indicated the formation of AgNPs. Fourier transform infrared spectroscopy (FTIR), X-ray diffraction method (XRD), Zeta- Size analysis, and cytotoxicity analysis (XTT) were performed. FTIR spectrum identified the functional biomolecules of the plant extracts, responsible for the bioreduction, stabilization of silver nanoparticles by creating a coating layer on the surface of the NPs. X-ray diffraction analysis revealed the presence of face-centered cubic crystalline structures of silver nanoparticles. The use of two different synthesis methods and different plants have formed in different zeta sizes (between 30 nm - 200 nm) of silver nanoparticles. The cytotoxicity assay of the silver nanoparticles prepared at concentrations between 0.1µg / mL to 5µg / mL on a mouse fibroblast cell line (L929) showed that all concentration values were free of toxicity. It can concluded that it is possible to obtain silver nanoparticles having antibacterial and nontotoxic potentials using the synthesis methods and different plant selections.

Keywords: Microwave-mediated green synthesis; Concentrated sun-light mediated green synthesis; Silver nanoparticles; Basil, turmeric, galangal and licorice plant extracts; Activity; Cytotoxicity

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PP18-Food Supplements for Mothers-Babies and Related Analysis

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Food supplement or dietary supplement is defined as "any food the purpose of which is to supplement the normal diet and which is a concentrated source of a vitamin or mineral or other substance with a nutritional or physiological effect, alone or in combination and is sold in dose form"[1].

Weight gain during pregnancy is important for both the normal course of pregnancy and development of the baby. Adequate weight gain during pregnancy is possible with the ingestion of energy, macro and micro nutrients at recommended amounts. While it is generally agreed that the scientific evidence for universal food supplement during pregnancy is ambigious, when undertaken with reason, it represents a benign therapy with potential for improved outcome. Newer data support more conclusively the therapeutic benefit of some food supplement to prevent spesific diseases.

In this review, food supplements consumed during pregnancy, breastfeeding period and infant's and also their related analysis were outlined[2].

Keywords: *gestation, infant health, food supplement, analysis*

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PP19-The Importance of Analytical Chemistry in Therapeutic Drug Monitoring for Personalized Medicine

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Personalized medicine (PM) has the potential to tailor therapy with the best response and highest safety to ensure better patient care. To achieve individual drug therapy with a reasonably predictive outcome, one must further account for different patterns of drug response among geographically and ethnically distinct populations. Pharmacogenetics is the science that studies how genetic variations in individuals affect their response to medications. Pharmacogenetic variability is major confounding factor in traditional weight base dosing or fixed dose.
Inter-individual variability in Pharmacokinetic variables including drug absorption, distribution metabolism and excretion may affect the blood concentration of drug so Therapeutic drug monitoring (TDM) approaches could solve the dosing problem. Therapeutic drug monitoring is a branch of clinical chemistry and clinical pharmacology that specializes in the measurement of drug concentrations in blood.
Drug analysis from biological material is a main goal of bioanalytical research area. The concentration of drug in biological samples is the important data for the developed analytical method. Chromatographic Techniques such as Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS) is a useful and powerful analytical technique for determining drug concentrations from plasma. When developing an analytical method for TDM, it is important to choose a clinically relevant calibration range. This quantitation range should be built around the proposed target concentration, covering the majority of samples as seen in the clinic.

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PP20-Assessment of Toxic Trace Elements in Packaged milk

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Chemical elements are widely distributed in our food, water, and environment, either naturally or because of human actions, such as industrial emissions, agricultural practices, or manufacturing contamination. Among them, lead (Pb), cadmium (Cd), mercury (Hg), and arsenic (As) are considered nonnutritive and toxic and are known to have deleterious effects, even in small quantities. Small quantities of some metals, such as iron (Fe), copper (Cu), manganese (Mn), chromium (Cr), cobalt (Co), and zinc (Zn), are nutritionally essential for a healthy life and are required in the body for its normal function, especially through various enzymes, hormones, and vitamins. However, these metals can still cause health problems when ingested in high amounts. Several cases of human disease, disorders, malfunction, and malformation of organs due to metal toxicity have been reported.

As a result, there is increasing concern about the health effects on humans due to continuous consumption of milk and similar beverages contaminated with metals around the world in recent years.

Inductively coupled plasma-mass spectrometry (ICP-MS) is a powerful tool for detecting a large range of trace metals in food, water, and environmental samples.

The aim of this study is to examine the toxic and essential trace element levels in packaged milk samples belonging different companies. The samples were collected from the markets in Turkey. In digestion procedure, microwave oven was used. The element concentrations were determined by ICP-MS. It was found that there are high concentrations of some elements in some samples. So, it was concluded that the milk samples should be monitored in terms of toxic trace element levels.

Key words: Toxic elements; milk; ICPMS; health risks

PP21-Overview to Curcumin on Human Health: Benefits and Warnings

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There has been considerable public and scientific interest in the use of phytochemicals derived from the diet to reduce risk and progression of major chronic diseases. Among them, *Curcuma longa L* has been used in Asian medicine since the 2nd millennium BC. Curcumin, a majör component of *Curcuma longa L*, has been shown to have the potential to contribute to the prevention of cancer and other chronic diseases due to various biological activities (1).
Although curcumin content is reported to vary from one batch of *Curcuma longa L* to another, the percentage has been estimated to be between 1.0% and 6.0% in 4 different "commercially available" samples.
The therapeutic effects of curcumin are mediated partially through its antioxidant and anti-inflammatory properties. Further, it can also modulate multiple signalling molecules like transcription factors, enzymes and secondary messengers, thereby controlling many gene expressions and is potentially effective in the case of many diseases associated with those signalling pathways. Poor bioavailability, rapid metabolism and limited adverse effects observed in some studies are major limitations to its therapeutic use.
Briefly, curcumin is now used as a supplement in several countries including the United States, India, Japan, Korea, Thailand, China, Turkey, South Africa, Nepal, and Pakistan. The most common human diseases against which curcumin has exhibited activities by human clinical trials include cancer, arthritis, cardiovascular disease, gastric ulcer, Crohn disease, ulcerative colitis, uveitis, ulcerative proctitis, peptic ulcer, oral lichen planus, gastric inflammation, vitiligo, psoriasis, acute coronary syndrome, atherosclerosis, diabetes, Dejerine–Sottas disease, diabetic nephropathy, diabetic microangiopathy, idiopathic orbital inflammatory pseudotumor, lupus nephritis, renal conditions, irritable bowel disease, tropical pancreatitis, β-thalassemia, acquired immunodeficiency syndrome, cholecystitis, and chronic bacterial prostatitis (2).
On the other hand, it is reported, recently, that curcumin has the potential to affect systemic iron metabolism, particularly in people with suboptimal iron status due to its chelator property. Again, Curcumin has also been shown to inhibit the activity of the drug-metabolizing enzymes cytochrome P450, glutathione-S-transferase, and UDP-glucuronosyltransferase. The inhibition of these enzymes in people taking curcumin may lead to an undesired increase in the plasma concentrations of some drugs and cause toxicity (3).
In this study, a detailed information will be present taking into consider Benefits and Harms of curcumin from the literature.

Key words: Phytochemicals; medicinal plants; curcumin; Curcuma longa L.

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PP22-Assessment of Co, Fe and Zn contents in Some Fish Species by flame atomic absorption spectrometry (FAAS)

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The elements needed of the body must be taken to sustain life in the human body. The excessive or inadequate intake of the elements can cause many diseases [1, 2]. Cobalt (Co), iron (Fe) and zinc (Zn) are essential elements for human body and they have a significant role in biological systems, and so; they are important in human diet. In general, foods such as fruit, vegetables and animal foods, carry various minerals and vitamins, and fish is one of the well beneficial kinds among them.

In this study, Co, Fe and Zn contents of ten fish species (such as *Cyprinus carpio*, *Scomber scombrus*, *Sparus auratus*, *Trachurus trachurus*, *Pomatomus saltatrix*, *Mullus barbatus* and *Mugil cephalus)* were examined by flame atomic absorption spectrometry. The muscle pieces of fishes obtained from local bazaar in different seasons were dissolved using microwave oven. The highest Fe (8.5±0.6 ppm) and Zn (11±1.2 ppm) levels were found in *Cyprinus carpio and Sparus auratus* spieces. Cobalt concentartions in all studied samples were found lower than the LOQ.

Keywords: *Essensial element, fish, FAAS, iron, zinc, cobalt.*

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PP23-Importance of Validity of Stability Indication Analytical Methods Used in Drug Analysis

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Gravimetric, titrimetric, spectrophotometric and chromatographic analytical methods are used in drug analysis.
Both the USP and ICH divide analytical methods into four separate categories;
Category I: Assay for the quantitation of major components or active ingredients
Category II: Determination of impurities or degradation products
Category III: Determination of performance characteristics
Category IV: Identification tests

According to the health authorities (FDA, EMA, PICs, Ministry of Health), the Category I and II tests methods of the active substances and pharmaceutical products should be the Stability Indicating Method (SIM). For the analytical methods to be Stability Indicating, stress tests must be performed first.
Stress tests are applied to identify and predict the degradation products that may occur during production and storage of pharmaceutical products. Stress test can be achieved by exposing the drug substance and pharmaceutical product, for extended period of time, to extremes of pH, at elevated temperature, to hydrogen peroxide and to UV light, to achieve degradation to an extent of 5–15%.
In order for the method to be used as a SIM, there should be a good resolution and no coelution for decomposition products during stress tests. It should be verified that each component's peak is pure by peak purity tests with DAD dedector. In stress test studies, mass balance calculations should be performed. These conditions are only possible by chromatographic analysis methods.
For validating analytical methods as SIM; system suitability criteria should be specific; be specific for the drug substance; be linear, accurate and precise; be robust to small changes in analysis conditions.

Keywords: Stability Indicating Method (SIM), Stress tests,Validation

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PP24- A New Carboxymethyl Cellulose-Based Local Delivery System for Local Topical Treatment of Periodontitis

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Abstract: A new gel-delivery system based on a series of formulations containing an active mixture of melatonin, hyaluronic acid, metronidizole and tetracycline, as antibiotic adjuvant therapy in periodontitis is exploited. The carboxymethyl cellulose gel has been used as matrix for this local delivery system. The mixture of active ingredients has been structurally studied applying UV-Vis and FT-IR spectrophotometry, differential scanning calorimetry and fluorescence microscopy. Our target was to put in evidence if melatonin, hyaluronic acid, tetracycline and metronidizole were preserving their specific characteristics when they would be mixed together in carboxymethyl cellulose. The recorded results are encouraging as each active compound maintains its characteristic functional groups imparting their biological action. The developed carboxymethyl cellulose based delivery system containing melatonin, hyaluronic acid, tetracycline and metronidizole is presenting itself as a promising candidate for topical treatment in periodontitis.

Keywords: Periodontal diseases; periodontitis; local drug delivery; carboxymethyl cellulose; hyaluronic acid; melatonin; therapeutic agents

Introduction: Periodontitis is an inflammatory disease of tissues involving the degeneration of periodontal ligaments, creation of periodontal pocket and resorption of alveolar bone, resulting in the disruption of the support structure of teeth. Various local or systemic approaches were used for an effective treatment of periodontitis. Currently, controlled local drug delivery approach is more favorable as compared to systemic approach because it focuses factors like site-specific delivery, low dose requirement and decrease in dosing frequency. So a number of polymer-based delivery systems like films, strips, microparticles, nanoparticles and nanofibers made from a variety of natural and synthetic materials have been successfully tested to deliver a variety of drugs [1-5]. These systems are biocompatible and biodegradable, completely fill the pockets, and have strong retention on the target site due to excellent mucoadhesion properties.
However, in this study, a new carboxymethyl cellulose-based local delivery system of melatonin, hyaluronic acid, tetracycline and metronidazole was prepared to be used as topical treatment for periodontitis. The aim of the present study was to evaluation of the new carboxymethyl cellulose local delivery gel formulation if each component of the proposed delivery system would maintain its specific characteristics.

Materials and Method: The new carboxymethyl cellulose-based local delivery system was puroposed basically for treatment of periodontal disease using hyaluronic acid and Melatonin with two drugs (an antibiotic and a chimiotherapeutic-antimicrobian agent: tetracycline and metronidazole) respectively [10,11].
In the new delivery system proposed; melatonin was used for its proved antioxidant and anti-inflammatory effects and acting as a mediator in bone formation and resorption [6,7]. Hyaluronic acid was used for its beneficiary role in tissue injury repair, wound healing and immunosuppression [8,9].
The structural changes of the new material's components have been investigated with fluorescence spectroscopy, ultraviolet–visible spectrophotometry (UV-Vis), Fourier-transform infrared spectroscopy (FTIR), Differential scanning calorimetry (DSC) and microscopy

techniques. In order to take advantage of the specific fluorescence behavior of melatonin and tetracycline the confocal fluorescence microscopy was applied.

Results and Discussion: The experimental results put in evidence unique spectra which combine the specific absorption bands/peaks for each individual compound. Also, the fluorescence microscopy proved that no structural changes occurred at the level of the functional groups of the components. Differential scanning calorimetry (DSC) and X-ray diffraction (XRD) results show that the loaded drugs are in a suspended form, the softening of the formulations starts at body temperature, but a part remains solid, providing sustained release.

Conclusion: It is possible to conclude that no interactions occur between the compounds used to obtain the complex mixture, and they would preserve their specificity in mixed formulations. Therefore, it is expected that the obtained new carboxymethyl cellulose-based delivery formulation would combine the specific local action of melatonin, hyaluronic acid, tetracycline and metronidazole, and may be effective for topical treatment of periodontitis.

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PP25- Calcium Selective Microelectrode and Handy Measuring Device for Dental Applications

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Abstract: A novel clinical device based on microelectrode technology that is able to determine the level of calcium directly in the periodontal pocket (saliva and gingival crevicular fluid) which we expect to offer an effective screening, evaluation and even treatment for the prevention of the periodontal disease is introduced. The developed device employing a calcium ion-selective microelectrode proved almost Nernstian characteristics in a concentration range of 10^{-1} to 10^{-5} mol/L.

The microelectrode membrane and solid-state contact were evaluated by using SEM to see the adherence between the membrane and solid-state contact on which there were found frequent connections reaching out from membrane to solid contact surface. The device and the electrode was tested using a gingival crevicular fluid and saliva. The obtained reliable electrochemical response persists the developed solid-state calcium microelectrode and the device into a useful tool for investigations over the evolution of the calcium level in GCF or saliva.

Keywords: Calcium, microelectrode, dental, medicine, handy device, gingival crevicular fluid

Introduction: The periodontal disease, one of the two major dental diseases that affect human populations worldwide at high prevalence rates[1-4], main cause of tooth loss, starts as gingivitis, advancing afterwards to periodontitis and severe periodontitis when the periodontal tissue's destruction occurs. Information related to current periodontal disease activity, its extent and severity, helps in formulating diagnosis, treatment plan and also provides essential information during disease monitoring phases of periodontal treatment. Both saliva and the gingival crevicular fluid are considered as possible markers for periodontal disease evolution[5-8]. We consider that the development of various types of microsensors able to assess the level of different ions in gingival crevicular fluid could be of great importance for early diagnosis and evaluation of periodontal disease.

As a consequence, in the present study, we have aimed to develop an all solid-state calcium selective microsensor that is applied to determine calcium level in saliva and gingival crevicular fluid and a handy measuring device.

Materials and Method: The solid-state contact mixture containing: graphite, 50% (wt), epoxy resin, 35% (wt) and hardener, 15% (wt) was dissolved in THF solvent. The calcium selective membrane was prepared using a PVC cocktail. In 5 mL of THF solvent were thoroughly mixed: PVC 29%, plasticizer NPOE 68%, calcium ionophore IV 2% and KpTClPB 1%, all added in mass percentage (w/ w). This membrane was further used to obtain the microelectrode. The calcium selective electrode obtained was conditioned for 24h in 10-2mol/L CaCl2 solution before its usage. The device and the electrode was tested using a gingival crevicular fluid and saliva[4], Firstly, base potential of artificial gingival crevicular fluid and saliva were measured. After that, specified amounts of 0.1 M $CaCl_2$ solution were added at marked times. Temperature, pH of the solutions, and the reference electrode used were same throughout the experiment.

Results and Discussion: The microelectrode developed is shown in Figure 1. In Figure 2, some of the obtained SEM images of microelectrode membranes together with solid-state contact surfaces (Figure 3 and 4) are presented. Selective membrane shows a clean and almost featureless flat surface with some wave-like formations. There is no sign of a defect which can potentially affect measurements. Solid-state contact surface is not without a number of cracks. However, these cracks shouldn't cause any significant adverse effects. In addition, slightly rough surface in micro scale indicates that solid-state contact can link up with the membrane easily.

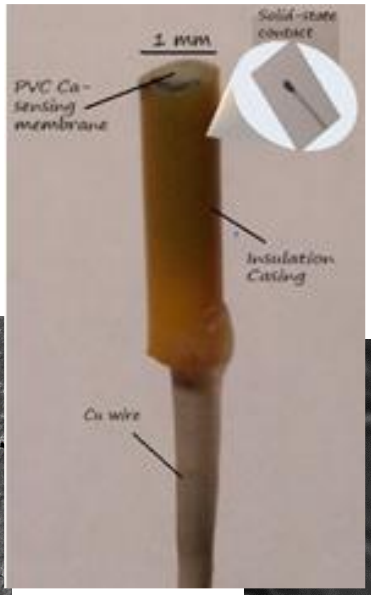

Figure 1. Calcium selective microelectrode

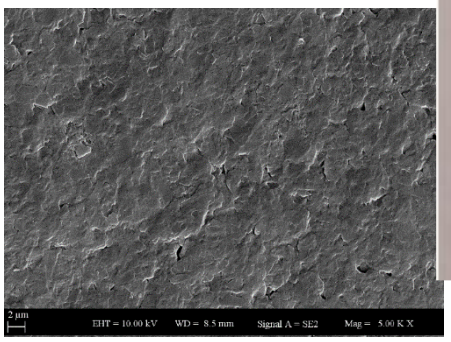

Figure 2. SEM images of Ca^{2+} ISE membrane surface

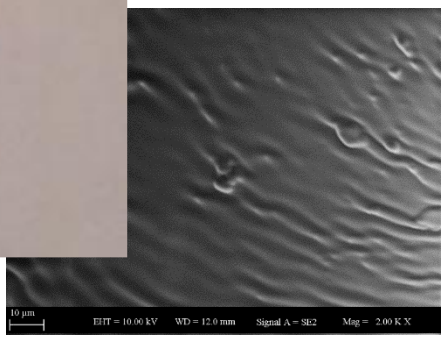

Figure 3. SEM images of solid-state contact

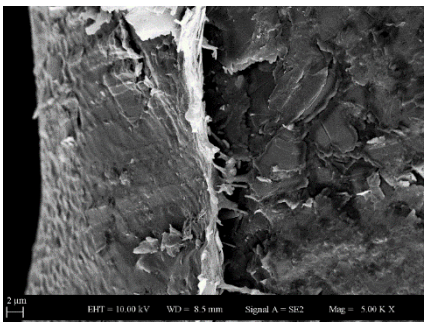

Figure 4. SEM images of Ca^{2+} ISE membrane–solid-state contact cross-section.

Frequent connections that reach out from membrane to solid contact surface can be seen in images above. Also there are several solid-state contact pieces some of which reach a few square micrometer on the broken surface of membrane which signal there might be a lot of surface to surface connections between them. This suggests that the necessary link for the electrode to work properly is present.

Electrochemical Characterization;

The calcium microelectrodes were electrochemically characterized. The specific potentiometric performance charecteristics of the prepared Ca2+-selective microelectrode was studied in detail. Some specific results are given here in Figure 5 and 6. The specific potentiometric behavior has been evaluated hydrogen phosphate and bicarbonate ions (Fig 5). These interfering ions were chosen taking into account the final application of the microelectrodes for the clinical area.

Calcium ISE Behavior After Autoclave Sterilization;

Sterilization is thought to be important due to the microelectrode that was intended to use in periodontal pocket in mouth directly. Therefore the Ca-selective microelectrode potentiometric performance after sterilization process is tested. Figure 6 exhibites Ca-selective microelectrode behavior in different concentrations of $CaCl_2$ solutions before and after autoclave sterilization.

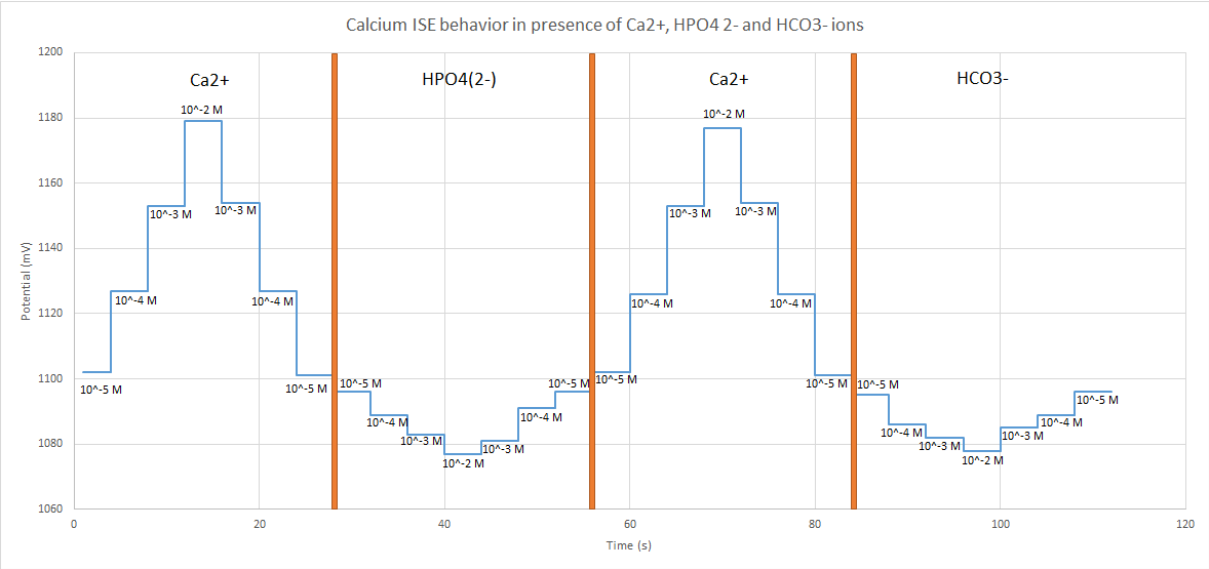

Figure 5. Calcium ISE measurement results in presence of Ca^{2+}, HPO_4^{2-}, again Ca^{2+} and HCO_3^- ions respectively. Measurements are taken for 10^{-5} – 10^{-2} M of solutions. Temperature, pH of the solutions, and the reference electrode used were same throughout the experiment.

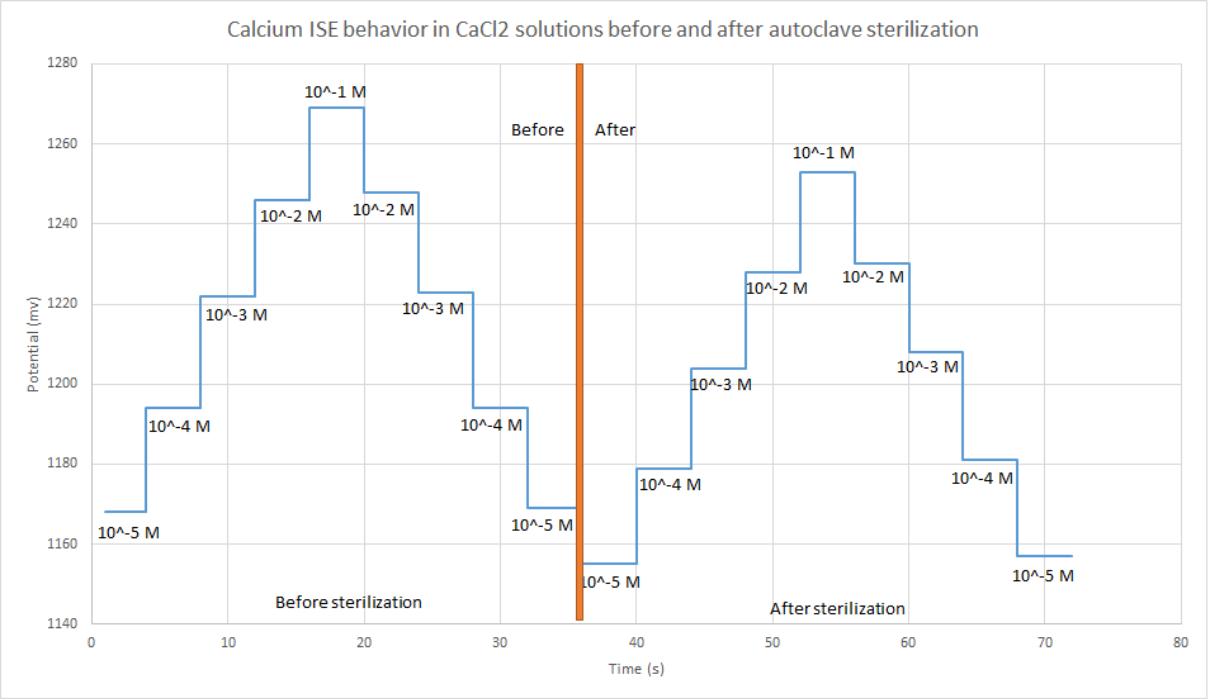

Figure 6. Calcium ISE behavior in different concentrations of $CaCl_2$ solutions before and after autoclave sterilization.

Ca Measurements in Artificial Saliva and Gingival Crevicular Fluid;

Saliva content in calcium ions is 1.2x10-3 - 2.80x10-3 mol/ L, which is similar to the calcium content in plasma. The gingival crevicular fluid could contain 10-2 mol/L calcium in healthy patients and up to 1.59 x 10- 2 mol/L calcium for in moderate periodontitis [10]. Following our intentions to develop a solid-state contact calcium-selective microelectrode for assessing the calcium level in the saliva (Fig 7) and gingival crevicular fluid (Fig 8) are represented.

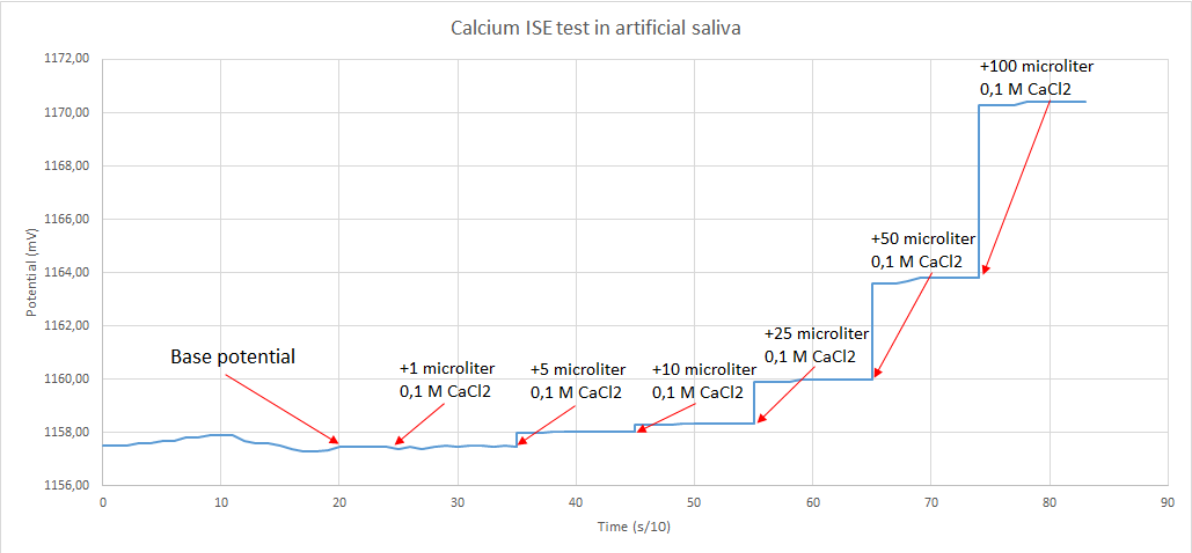

Figure 7. The calcium-selective microelectrode tested in artificial saliva obtained by standart addition method using the device developed.

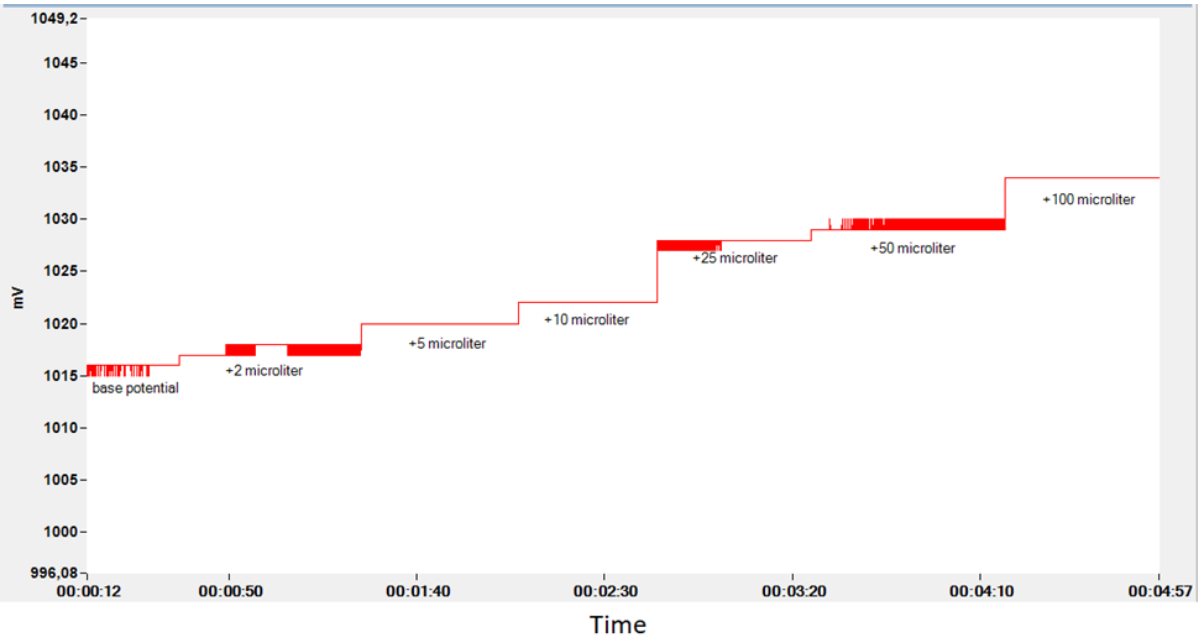

Figure 8. The calcium-selective microelectrode tested gingival crevicular fluid obtained by standart addition method using the device developed.

Development of Ca Measuring Device;

Our new designed single channel calcium ion selective handy measurement device has ability to determine concentration of calcium ion in the saliva fast and quickly.

After the device starts, 2 different calibration options appear (Fig 9) 1-point and 3-point calibration mode. If the device is calibrated once before in 3-point calibration mode, then it has the previous calibration data already saved in its internal memory. Else, in the first usage, 3-point calibration mode must be selected.

After the calibration, the device starts measuring calcium ion by using Ca^{2+} selective sensor and micro-sized reference electrode in a mini-sized tip developed in this study, in both mV and concentration mode. User can switch measuring mode with joystick on the device (Figure 10).

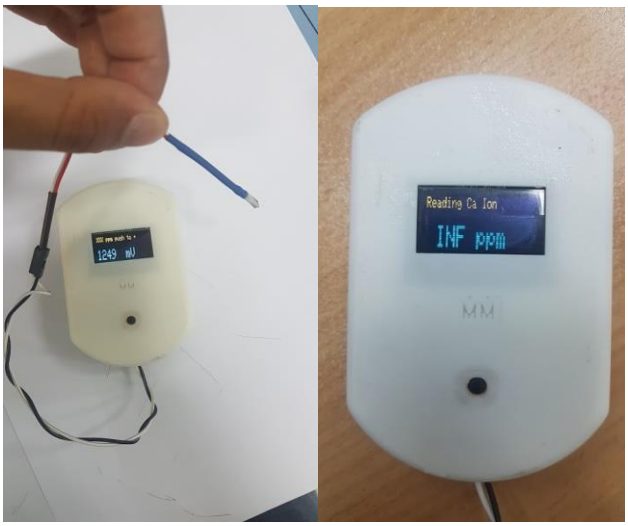

Figure 9. Calibration modes

Figure 10. Calcium selective sensor and handy measuring device

The device has 90 mAh rechargeable li-ion battery and consumes nearby 45 mAh while working. Device charges battery in 20 minutes totally and works 2 hours with one charge means 2 hours on screen time. The device's overall design is very portable, easy to hand and have simple user graphic interface that controlled only with one joystick. The ion selective sensor is designed as suitable as work with dental cavity. It is made of flexible and durable silicon isolated copper wires. Sensor can easily attach and detach to the device over 2 pin electronic contact port.

Conclusion: Due to its characteristics and miniaturization, the obtained calcium microelectrode and the measuring device could be easily used in biomedical environment, clinical studies and particularly in dental medicine for gingival crevicular fluid assessment in periodontal disease.

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Index